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Original Communications.

THE EXTERNAL AND INTERNAL USE OF GUAIACOL, WITH BRIEF REPORTS OF CASES.

By J. M. Anders, M.D., Ph.D.,

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GUAIACOL, as a local means of cure and relief in certain painful affections, has been employed to a considerable extent by a limited number of physicians.

The antipyretic effects, when applied to the skin surface, were first observed by Dr. Desplats, Professor at the Medical Faculty at Lille. J. S. Cohen noted a reduction of fever following its external use, in tuberculous patients, with gratifying results. J. M. Da Costa found its application to the skin to be followed by marked reduction of temperature, without decided change in the pulse or cerebral disturbance. W. S. Thayer has also noted its antithermic action in eight cases (three typhoid, two pneumonia, two pulmonary tuberculosis, one rheumatism) in Professor Osler's wards at the Johns Hopkins Hospital. The results obtained by Thayer showed that while the anti-

pyretic action was very striking, the profuse sweating and marked chills, in some instances (even when guaiacol was given in small doses), and the decided weakening effect, noted by some observers, make a limited application probable. When administered internally, its effects are similar to those following the administration of creosote and carbolic acid.

My own experience with guaiacol as an antipyretic has been limited to three cases (two of typhoid and one of broncho-pneumonia). In the typhoid patients, the temperature in the first case ranged from 102° to 104° F. during the fastigium. The use of guaiacol, applied to the skin, was commenced on the eighth day of the fever, the amount used at each application having been ½ drachm. Reduction of temperature followed every painting, the drop varying from 1.4° to 3° F. The applications were made twice daily, or at 3 P.M. and again at midnight. The fall was usually slow, and began about one-half hour after the employment of the agent, continuing for three or four hours, followed by a rather rapid rise of temperature to its former height, usually. Profuse sweatings were induced by the effects of the guaiacol, and in this instance, on the thirteenth and sixteenth days of the disease a quite severe rigor occurred. Accompanying and immediately following the chill, the temperature rose rapidly to a point 1.3° F. above the previous maximum. This observation has not, so far as I am aware, been previously made, and the fact that the temperature thus suddenly ascends to a high level is to be regarded as an additional effect of this plan of treatment. The other case of typhoid, in which guaiacol was applied to the skin surface for the purpose of reducing the temperature, pursued a favorable course throughout. The influence exerted upon the temperature curve was similar to that noted in Case I., but rigors did not occur.

In the case of broncho-pneumonia, in which this antipyretic was employed (in the usual dose, ½ drachm), the patient made a good recovery, without incident. The applications of the remedy were not followed by so marked a reduction of temperature as in the typhoids.

The local physiological action of guaiacol is that of a decided sedative. Thus, it has been known for some time that, when administered internally, it allays the irritability of the nerve terminations in the gastric mucosa. In five cases of gastralgia I have given it in doses of 2 to 3 minims, as per the following formula:

℞ Guaiacoli,
Glycerinæ, of each, ʒi;
Aq. menth. vir., q. s. ad ℥iiss. M.
Sig.—1 drachm every four hours, as directed.

Its analgesic effects were prompt and usually maintained from three to four hours.

In a case of acute gastric catarrh its effects were a little less gratifying, but, on the whole, quite favorable. The subject was a male, aged nineteen years, who had committed an error of diet. The temperature was 103° F. and vomiting was frequent, while the gastric pain and oppression were pronounced. The nausea, which is a prominent feature in this affection, was greatly relieved as the result of its action. The duration of the attack was brief. No other medicaments were employed, because seemingly unnecessary.

It is to be recollected that an overdose of guaiacol may produce serious local and general effects; hence it is to be used cautiously. Dr. Oscar Wyss reports a fatal case of guaiacol-poisoning in a nine-year-old girl, who swallowed by mistake 1¼ drachms. The autopsy showed wide-spread lesions. The local effects embraced glossitis, superficial pharyngitis, follicular gastritis, with small excoriations and enteritis. Kobert, in his text-book on "Intoxicationen," points out that, after 1 gramme (15 drops) of guaiacol, slight indications of poisoning may supervene. The symptoms are chiefly local (a burning feeling in the stomach, nausea, etc.).

Acting on the suggestion of Ferrard, who has used this drug in sciatica and intercostal neuralgias (painting it over the course of the nerve, mixed with an equal part of glycerin), I have used it similarly in eight cases. Of these, there were supraorbital neuralgia, three; sciatica, two; intercostal neuralgia, two; and neuralgia of the anterior crural, one. In the case of neuralgia of the anterior crural, applications of guaiacol to the skin, over the course of the nerve, cause some degree of lessening of pain. Subsequently, the drug was used hypodermically, the needle being introduced immediately over the affected nerve. The dose was 2 minims diluted with 10 minims of chloroform. The effect of this combination was striking. After the second injection, which was made twenty-four hours after the first, pain was completely relieved, and it did not recur.

The first case observed was in a female, aged forty years, who gave a family history of rheumatism. The neuralgia pains had lasted for a couple of days, when the characteristic eruption of herpes appeared, which eruption

was confined to one side of the trunk. It was during the latter stage that I first saw the patient. The pain, as is usual in cases of herpes, had ameliorated with the appearance of the eruption. Following the appearance of the herpes, the neuralgia recurred with considerable violence. For this symptom I prescribed guaiacol locally, in the manner previously detailed. As the result of its use the pain yielded, though it was found necessary to apply it at intervals of six hours. The second case of intercostal neuralgia in which this remedy was resorted to occurred in a young female who was decidedly anæmic and somewhat neurasthenic. The guaiacol was applied three times daily. This kept the pain in abeyance, but did not cut short the attack, since there was manifested a tendency to recurrence during a period of three months or till the causal conditions, which were of hæmic and nervous origin, were entirely overcome. I desire to make brief allusion to the two cases of sciatica in which guaiacol was used as a local measure.

Case I.—A male Hebrew, aged forty years, occupation merchant, first consulted me in May, 1894. The patient was suffering greatly, the pain coursing along both sciatic nerves. On making pressure with the fingertip over the track of these nerves, there was some degree of tenderness. I learned at the time of my second visit that the patient experienced inordinate thirst and hunger. The latter symptoms, together with the history of double sciatica, which had lasted for a period of three or four months, led me to suspect diabetes mellitus. An analysis of the urine was made immediately and a small percentage (1.5) of sugar discovered, while the quantity of urine voided was eighty-five ounces per diem. The treatment of the diabetic element consisted in restricting the diet after the modified Ralphe method (which may be found in Strumpell's "Text-Book of Medicine," p. 980), and the use, internally, of codeine sulphate in increasing doses. As the result of this treatment the percentage of sugar was greatly diminished, but not entirely removed from the urine. For the bilateral sciatica, which was distressing to the patient, I first employed, hypodermically, injections of chloroform (dose, 10 minims) twice daily. This had the effect of ameliorating, to a slight extent only, the severity of the pain. At the end of two weeks guaiacol (2 minims) was combined with chloroform (10 minims) and used hypodermically over the seat of greatest pain. Admirable results followed. At first two injections daily, and later one, served to render the patient comparatively comfortable. His gait, which was at one time greatly impaired, had returned to one approaching the normal. When last seen, about one month since, the patient's general condition was fairly good, while the sciatic neuralgia demanded but a single injection every second day on an average.

Case II.—A. K., aged twenty-eight years, born in Poland; occupation, miner; admitted to the male ward of the Medico-Chirurgical Hospital July 3, 1894; family history negative. The patient states that many years since he had a chancre, but does not know whether it was of the hard or soft variety. Prior to the onset of the present illness his health was remarkably good. Three months ago he fell and struck the sacral region on a door-step. Subsequently, had much pain in the mid-sacral region, which extended to the left as far as the sacral notch. Under pressure, complained of pain and tenderness over upper portion of left sciatic nerve; also in the hip-joint on making pressure upon the head of the great trochanter. Careful inspection of the throat shows absence of any scars, though there are very slight inequalities presented by the surface of the tibiæ. After having treated him for three weeks for rheumatism, which was supposed to have followed the accident above referred to, by the use of antirheumatics, including the iodide of sodium and syrup of hydriodic acid, I began, July 24, the local use of guaiacol with an equal amount of glycerin. On July 28, four days later, the following note was made by the then resident physician, Dr. Beardwood: "Improvement has been steady since guaiacol was started; walking greatly improved." When the patient was discharged, September 7, 1894, he was practically cured. But though the pain and stiffness in this case were ascribed to rheumatic infection, and the guaiacol was used simply as a measure to relieve suffering, it proved to be actually curative in its effects. As before stated, guaiacol has been employed by the writer in three cases of supraorbital neuralgia.

One of these instances appeared to be due, clearly, to malarial toxæmia, since it occurred in a subject residing in a malarial district, and the pain occurred in paroxysms every alternate day about the same hour. Quinine was administered in daily doses of 20 grains, while the guaiacol was applied over the supraorbital for its analgesic influence. This had the effect of mitigating the pain, but by no means relieving it completely.

An instance of trigeminal neuralgia, chiefly involving the supraorbital nerve, in which the local action of guaiacol was tested, occurred in

a female, aged fifty-nine years, who was admitted to the medical wards of the Medico-Chirurgical Hospital October 2, 1894. The patient herself had never suffered from rheumatism, though both parents had been severely afflicted with the disease. Her general condition indicated healthy bodily functions. In view of the family history, the iodide of sodium (in doses of 10 grains, three times a day) was exhibited. Guaiacol was used locally in the manner before indicated. After the third day all pain, which had previously been quite severe, had disappeared, and, up to the time of her discharge, about three weeks later, did not recur. With the cessation of the pain the use of guaiacol was discontinued.

Guaiacol was also successfully tried in a case of supraorbital neuralgia which proved to be quite intractable to the measures ordinarily resorted to in this affection. In this case, which occurred in a male, thirty-five years of age, without assignable cause, the remedy was employed by the hypodermic method, the dose being 2 minims dissolved in 10 minims of chloroform. The skin was punctured at the point at which the nerve emerged from the deeper structures to the skin. Not more than three injections were required to relieve permanently the condition.

This drug has also been employed by the writer in half a dozen cases of acute and chronic rheumatism with only moderate success. It may be said to relieve pain of rheumatic origin to an extent equal to that of any known remedy, and hence highly useful; but it does not appear to cause any reduction of rheumatic inflammatory processes.

In conclusion, it may be remarked that the results obtained from the use of this agent in my own hands indicate the probable correctness of the following inferences:

1. Guaiacol is an efficient local sedative, as shown by its analgesic power when employed in painful affections.

2. It is more potent when administered hypodermically than when applied to the skin surface.

3. It has not, in practically afebrile conditions, produced any noticeable lowering of temperature or other unpleasant effects, in my experience.

4. When employed in febrile affections, it may cause objectionable effects, such as rigors, followed by high temperature.

5. Guaiacol seems to be powerless to control inflammatory processes, particularly when acute in character.

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IDIOSYNCRASY AND DRUGS.

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THIS paper does not pretend to give many new observations; it presumes to enunciate truths proved by a consideration of many disjointed facts made plain by many observers, but of which the relationship has been, to say the least, obscure. While it contains some inductive philosophy, this latter seems to be of as much practical importance as the mathematics used in the computation of interest. The author believes that knowledge reduced to a formula will be put to greater use by the medical profession on this account. He has never seen the laws formulated here recognized before; their value the profession will decide.

The Basis of Idiosyncrasy.—Individuals, as distinguished from groups, exhibit unexpected manifestations of the action of a drug which *prima facie* indicate that there are at work erratic forces subject to no law. For this indefinite idea we have the word idiosyncrasy. That the idea is very indefinite is proved by the attempt to describe it. Perhaps the prevalent opinion is that it is useless to attempt to discover the essence of the thing indicated by this word, and certainly no definite exposition of what it really is has yet been accepted. Typical samples of definition are found in the following: "Any special or peculiar characteristic of temperament by which a person differs from other persons of ordinary habits" (Gould, "A New Medical Dictionary," 1891). "A mental quality or habit peculiar to an individual; constitutional peculiarity; distinctive characteristic" ("Standard Dictionary," Funk & Wagnalls, 1893). "An individual peculiarity of constitution and susceptibility" (Billings, "The National Medical Dictionary," 1890). "Any singularity of constitution" (Cleaveland, "Pronouncing Medical Lexicon," 1890). Leaving the Greek roots to the etymologists, the intention of the present writer is simply to determine what is the fundamental condition which determines and controls the peculiarity, and to attempt to make a concrete term out of the abstract one, as used in a medical sense; certainly no practical application of the idea of idiosyncrasy can be made until that idea is made definite, or at least much less vague than it seems to be at present.

A study of idiosyncrasy is necessarily a study of individual cases, and any propositions laid down must be inductive generalizations. With-

out filling a volume with a *résumé* of instances, the following well-known observations may be taken merely as typical examples. A study of all accessible cases—the literature of observations is too large to enable any one to say that he has seen all the reports—discloses characteristics in consonance with the law to be laid down later, and the author feels safe in saying that any case will be discovered by sufficient study to be governed by this law and to be within the definition now formulated.

For example, the peculiar subjective noises produced by quinine vary in intensity with the same dose, and conversely the causative dose varies in two cases of the same intensity. This variation is to-day explained as being due to individual idiosyncrasy, and bears no relation to any objective signs which might enable us to calculate or predict the dynamic force of the drug as displayed in this effect. Now, the students of materia medica have demonstrated that this tinnitus aurium is due to the action of the drug directly upon the nerve-cells of a part of the brain. The more these cells are stimulated the greater the tinnitus. But as the effect varies in different individuals while the dose remains constant, the variation must be fundamentally in the sensitiveness of these cells to stimulation or irritation. Again, there are persons in whom morphine causes quick and brisk catharsis, while ordinarily the drug constipates. This drug lessens intestinal secretion and peristalsis by stimulation of the splanchnic inhibitory centre; overstimulation is always depression; with increasing sensitiveness in the cells of this centre, the quantity of morphine which usually stimulates to moderate action now overstimulates to paresis of inhibition, and secretion and peristalsis ungoverned become catharsis. The present writer has an idiosyncrasy towards quinine the like of which he has never seen reported. The principal symptoms are dilatation of the arterioles and swelling and great excretion from all the mucous membranes to a degree which threatens life from œdema of the lungs; a fraction of a grain of quinine will cause these symptoms to be marked, and the dust inhaled while opening a can of the drug will produce them in an appreciable degree. The symptoms are those produced by paralysis of the sympathetic nervous system; quinine ordinarily depresses the sympathetic in direct ratio to the dosage, this depression being from overstimulation; increased sensitiveness to the drug causes in one individual the depression to advance to paralysis.

Without multiplying instances, it may be said that every case of idiosyncrasy is fundamentally a supersensitive condition of some part of the body; and when we ascertain what anatomical structure is affected in each instance, we generally, if not always, find it to be a part of the sympathetic nervous system,—*e.g.*, the splanchnic centre and the vaso-motor nerves in the cases named above. The generalization may now be made—and it becomes a concrete definition—that *idiosyncrasy is an increased irritability, usually of one or more parts of the sympathetic nervous system.*

An interesting study is the fundamental relation between idiosyncrasy and temperament. One difference between them is, that in the case of temperament the variation from the average occurs so often as to lead to the formation of classes from isolated individuals; while an idiosyncrasy, having been considered inherent in but one individual, has never been compared or grouped with others. This latter fact has discouraged study of the subject and caused idiosyncrasic symptoms to be looked upon as erratic manifestations of nature's vagaries, and, being amenable to no law, consequently outside the domain of rational therapeutics. Modern study of astronomy, physics, and medicine itself has pretty clearly demonstrated that even comets, electricity, and epidemic diseases are acting according to fixed plans, and that there are no exceptions to rules; the difficulty is in formulating the intricate system under which all things act and are acted upon. It requires no greater prophet than reason to predict that in the future all the apparently unrelated idiosyncrasies will be found to be acting under laws as fixed and as general as those which govern asepsis. The danger will be in hasty generalizations not warranted by accurate observations.

Therapeutics and Idiosyncrasy.—In practical therapeutics, when an idiosyncrasy to a drug is accidentally discovered, the usual symptoms should be studied in the light of physiological and anatomical knowledge. This will indicate what is the essential causative change which has produced the unusual objective symptoms. As laid down in the preceding pages, it will be found to be an increased sensitiveness of some part of the anatomy and perhaps always of some portion of the sympathetic nervous system. On this foundation much can be built. The particular structure may be treated in such a way as to permanently lessen its irritability, exactly as an "irritable heart," a photophobia, or a hyperæsthesia may be cured; or another drug may be administered coincidentally as a corrective which will counterbalance the irritation of the

principal one without interfering in the least with that part of the physiological action of the latter which is put to therapeutic use,—*e.g.*, minute doses of atropine to counteract the paralysis of the sympathetic by the quinine without lessening the antimalarial power of the latter, in the case taken, for example, before. Again, having discovered an abnormal irritability in one structure, we may expect that the idiosyncrasy will not be confined to the one drug, but will be manifested towards all drugs acting in the same way upon those particular cells. Thus, atropine and camphor both stimulate certain parts of the nervous system, including the cerebrum and some of the centres, and if there is a hypertonic condition of these certain cells, both drugs will unduly act upon them. In one case of the author's, where, gauged by other drugs, about ten times the dynamic effect to be expected was produced by belladonna, a small dose of camphor caused toxic convulsions, and four years after a minute dose of fluid extract of belladonna brought on alarming symptoms of poisoning.

The general principles of applied therapeutics must govern the methods by which idiosyncrasy may be combated. Often a drug which lessens the irritability of certain structures will, if long continued, create a permanent loss of sensitiveness, as is seen in the long-continued anaphrodisiac effect of large doses of the bromides exhibited regularly for a long time; it seems that a physiological habit may be established in the body, as a mental habit may be produced by continued psychical action. Having located the anatomical seat of supersensitiveness which is the basis of the idiosyncrasy in a given case, some drug may be administered for a considerable time which depresses the functional activity of this particular structure. It will be usually much easier and equally effective, and therefore much more desirable, however, to adopt the second method mentioned of the coincident administration of some drug which will counterbalance the hyperdynamic action of the principal drug upon the cells affected. Of course this is simply producing for a short time, during which the idiosyncrasy is manifested,—that is, for the duration of the physiological action of the drug towards which the idiosyncrasy is manifested,—an antagonism of the part of that physiological action which is magnified by the increased sensitiveness of the cells, and is the same antagonism which, long continued, becomes permanent in the first-named method. The third method of combating the idiosyncrasy is preventive rather than curative, but from this very reason is perhaps most valuable. As idiosyncrasic effects are really more or less toxic, it contemplates preventing the poisoning rather than the administration of an antidote. Although it presupposes considerable knowledge of physiology and materia medica, the physician who feels deficient in these departments of medicine may console himself with the fact that it is only the case at hand which is to be studied, much as the lawyer reads up decisions bearing only upon the case at trial. The following notes may be of service to him in saving much searching through the immense library of medical specialized knowledge, which is the sum total of what is admittedly true or judicially proved to-day.

The effects of any drug upon an individual with an idiosyncrasy towards it are never in a new direction,—that is, a new dynamic action is never exhibited in these cases. The normal physiological action is never changed in kind, but only in degree. If a certain drug stimulates the cardiac ganglia, in no individual does it ever primarily depress these ganglia because of his idiosyncrasy. If another drug lessens the action of the nervous mechanism dominating the process of secretion, in no idiosyncrasic case does it stimulate its function. There are two primary principles in the physiological action of drugs which are so important that one may be pardoned for stating them here at the risk of writing platitudes. One is, that overstimulation is always depression, and this is as true of the least important centre or the most minute group of cells as it is of the cerebrum. It is most readily seen in exhaustion of muscles from overexertion, but sometimes is manifested with as much force in paralysis of the heart-force from an overdose of digitalis. The other principle is obvious as soon as put into words,—that stimulation of inhibition lessens action. It is also a fact that general stimulation of the sympathetic lessens glandular action, and the converse.

It is now a truism that the action of large doses of many drugs is different from that of small doses. The difference is due to greater inhibition of something, or else to greater stimulation of something (increased inhibition being stimulation of inhibitory nerve-cells), generally reversing the effects and apparently making a change in kind of action, although it is really one of degree. It follows that an observed depression, or manifestation of depression, is often essentially and *per se* a stimulation. This must never be lost sight of in the accurate study of medico-dynamics necessary

in dealing with the subject of idiosyncrasy. This overstimulation may be produced not only by an increased quantity of drug—overdosage—acting upon a normal structure or group of cells, but may be the result of the action of a normal quantity of drug acting upon a structure or group of cells which has an increased susceptibility to the stimulation. It seems *apropos* to use as a simile the fact that a given amount of intoxication may be produced in one brain by a certain quantity of alcohol, and in another more sensitive brain a dose of alcohol ordinarily slightly stimulant may cause complete paralysis. But it must not be forgotten that one stimulus may affect only a small group of cells as much as another does the entire nervous system.

What may be called a working knowledge of the dynamic action of drugs does not always include those facts equally true and equally well proved, of which no therapeutic application is made because of the lack of energy in the drug in certain directions. Yet one of these minor actions, which requires instruments of great precision to even discover it, may, when magnified sufficiently, equal and even dominate those effects of the drug usually pre-eminent and ordinarily used therapeutically. It is here that most of the mystery inherent in this subject of idiosyncrasy has had its origin. When the administration of a dose of some commonly used drug was followed by symptoms which were never thought by the observer in connection with that particular part of his armamentarium, it has seemed to him that the whole plan of the universe had been changed for his especial worriment and mystification. Yet the fact may have been that the same drug in every case was producing in slight degree exactly the same effect, but this effect was marked so slightly as to be indiscernible by the unaided senses. Thus, the salicylates stimulate the sympathetic nervous system, but few practitioners ever saw this action manifested. Calomel stimulates the solar plexus, a fact of little interest to most physicians, whose minds are filled with more important things; and yet calomel in an individual whose solar plexus is supersensitive will produce effects and symptoms which one would never dream of being rationally and naturally a part of the physiological action of that drug unless his attention had been called to the matter, and he would probably adduce them as a proof that idiosyncrasy is entirely without the pale of philosophy and rational medicine.

If both the above conditions exist at the same time,—if we have an undue increase of dynamic effect in a minor direction, making an apparent change of effect,—then the idiosyncrasy will apparently bear no relation whatever to the normal physiological action, although attention to the above facts will demonstrate the constant, definite relations which have always obtained.

It is apparent by this time that great care must be taken in investigating the details of the dynamic action of each drug towards which an idiosyncrasy is exhibited. It is unfortunate that many text-books on materia medica slight physiological action even in its most useful phases; it is even more unfortunate that so many authors adopt the conclusions of some single experimenter, saving the trouble of forming a judicial decision based upon many experiments by a number of workers and thus excluding the various sources of error. But medical literature to-day is so far advanced that with a little pains any physician may inform himself, from the several carefully accurate text-books in existence, of even the minor details and subservient effects of drugs upon the human economy.

As an aid to the study of this part of the subject, the following list of these minor effects has been compiled. It includes only those drugs which are more or less commonly used, and omits reference to those effects which are so marked as to be often therapeutically useful, and consequently generally known to the rank and file of the busiest of the professions. The statements are either generally admitted or susceptible of proof by the reports of experimenters, each corroborating the other consciously or unconsciously, and are based upon a very careful study of practically the whole field of testimony in each case. It is manifestly impossible in each case to give credit to him whose hours, weeks, or months of careful, laborious toil has been summed up often in a fraction of a line. In justice to those whose work he is taking advantage of in the following *résumé*, the present writer has omitted any sign to indicate the comparatively small portions which are based upon his own experiments and observations. The important thing is, that a hypertonic irritability or sensitiveness of the structure acted upon may cause any of these minor effects to become very marked or even toxic—idiosyncrasic.

Aconite and all its preparations produces local irritation of the digestive tract, optic paresis, and depression of the vaso-motor nerves; a depression of all the sympathetic system of nerves, too slight in some instances to measure, is an hypothesis with some argument in its favor.

Arnica produces an irritation of the fauces and digestive tract and much less irritation of the skin; the heart-rate and force are increased, and this stimulation becomes overstimulation (depression) later; the accelerator apparatus is the part affected, and the stimulation similarly affects the respiration. Overstimulation causes paresis of all muscles, including the heart and respiration, by the action of the drug upon the nerves energizing them. The kidneys are irritated during the excretion of the drug exactly as the digestive tract is during its absorption or the skin by its local application.

Tobacco contains many other active principles (ordinarily of very weak dynamic action) besides nicotine. Most of these have not been thoroughly worked out, and valerian, tonka, etc., are found as an addition to most cigars. The depression from the nicotine is altogether an overstimulation, the primary action being tetanic.

Physostigma stimulates the entire sympathetic system more or less, and overstimulation causes marked depression.

Nux vomica contains, besides strychnine, the alkaloid brucine and other elements which are not inactive, although of very little power under ordinary circumstances. Strychnine and brucine are each active forces, and in some directions they synergize each other, while in their action upon other parts of the anatomy they are antagonistic in the tendency of their dynamics. Each varies in the quantity found in different specimens of seeds, and when there is also a variation in certain cells to the action of one or the other, the exact effect of a dose of some preparation of the crude drug is incalculable. The reported idiosyncrasic effects of *strychnine* itself have always been manifested simply as toxic symptoms from a dose which in size was no larger than usually given for medicinal effect. The minor actions of this alkaloid are nearly all prominently manifested in cases of poisoning, with the symptoms of which the profession is very familiar. *Brucine* has not been accurately and thoroughly studied to a sufficient extent to enable its minor actions to be stated with confidence.

The *bromides* lower the heart-rate and produce anæmia of various nervous centres, lessening their tonicity in this way. The bromine element has its action modified by that of the base with which it is chemically combined, although usually this modification is too slight to be perceptible; and again, the bromine may be disjoined from the base in the body, producing the effect usual to that element at the time and place of excretion. Many manifestations of "bromism" are due to the irritation of the bromine in process of excretion unconnected with the base to which it was united when ingested. When there is an excessive irritability resident in certain cells to the stimulus of, for example, ammonium, then the dynamic action of this element will be shown with increased emphasis, modifying, assisting, antagonizing, and counteracting the effect of the bromine element upon this or that group of nerve-cells until all semblance to the effects we have learned to associate with bromide of ammonium is lost. The principles underlying these changes of dynamics apply also to all salts used as drugs, whatever the base or the acidulous radical may be.

Opium in itself is perhaps the most complex drug found in the pharmacopœia. This inspissated juice contains morphine, codeine, narcotine, thebaine, narceine, papaverine, cryptopine, gnoscopine, protopine, lanthropine, pseudomorphine, hydrocotarine, laudanocine, laudonine, rhoeadine, codamine, meconodine, meconin, meconoissin, lactic acid, meconin acid, and a number of alkaloids which are suspected to exist with more or less reason and have not been isolated. The important thing is, that each of these principles, known, disputed, and unknown, has a dynamic action peculiar to itself, and of an energy which, while ordinarily constant, yet must vary with the susceptibility to stimulus of each group of nerve-cells, and indeed each cell with which it comes in contact. The physiological actions of most of the constituent principles of opium have not been worked out with any degree of accuracy, even as regards alkaloids which have been certainly isolated and their chemical properties determined. The little that is known will, however, serve to indicate the complexity of this branch of the subject.

Narcotine is not narcotic at all, and stimulates the spinal cord and sympathetic system much like strychnine, although it usually acts with little energy in this or in any other direction.

Thebaine acts very much like strychnine, producing marked tetanizing effects in sufficient doses; the proportionate quantity in opium is so small that its share in the dynamics of the latter crude drug is too small to be perceptible under ordinary circumstances.

Narceine affects the cerebrum more than other parts of the economy, but the alkaloid is so difficult to completely isolate from others that nothing certain can be predicated of it.

Papaverine has a physiological action peculiar to itself, but exactly what it is the evidence

is too conflicting to enable us to say with certainty. It is probably both convulsant and narcotic, having, like many drugs, a secondary action the reverse of a primary action due to stimulation.

Codeine is quite active, and in importance is second only to morphine. It primarily stimulates the cord, sympathetic system, and peripheral motor nerves, which stimulation becomes paralysis from a sufficient energy of dose to produce overstimulation. It lessens sensation in the sensory nerves. It has less effect upon pain, secretion, peristalsis, and the cerebrum than has morphine, and exactly how it produces similar but feebler effects (whether by lessened action upon the same mechanism or through some other channel) has not been worked out.

Morphine, among other things, lessens peristalsis by stimulation of the inhibitory fibres of the splanchnic portion of the sympathetic. While perspiration is increased, it is checked at first. All secretions are affected by its action on the sympathetic. The cardiac symptoms produced by morphine are due to stimulation of the inhibitory fibres of the pneumogastric (slowing the rate) and stimulation of the cardiac ganglia and muscular fibres (increasing the force), while the tension is raised by the assistance of the contraction of the arterioles due to stimulation of the vaso-contractor portion of the sympathetic. Large doses would excite the cord to tetanus were this not counterbalanced by the cerebral depression produced. The respiratory centre in the medulla is stimulated, and the overstimulation of toxic doses produces paralysis of this centre and consequent death from stoppage of the respiratory apparatus.

It is now plain that almost any portion of the nervous system may be stimulated, and paralyzed by overaction, by some of the constituents of opium. Should any group of cells be supersensitive, they are apt to find in opium an irritant to which they quickly and energetically respond, although normal cells are slightly affected by this same irritant. *A priori*, we should expect a large number of cases of idiosyncrasy towards opium because of these conditions. The clinical history of medicine shows more instances of untoward effects from opium, perhaps, than from any other drug, and this may be noted here as corroborative evidence of the truth of the general proposition laid down in the preceding pages.

Chloral has very variable degrees of energy in its action upon the nervous system, the variation being in the cells of the body and not in the drug, as is proved by the fact that the same sample of the latter produces different degrees of action in different individuals, while the same individual shows a constant susceptibility to different samples of the drug. It irritates the digestive tract slightly, and this irritation of epithelium is manifested by the drug as it is passing through the kidneys and the lungs in the process of excretion. In the case of the pulmonary mucous membrane this irritation is too slight to be noticed normally. There is a primary stimulation of the cerebrum, the vasomotor system, the cardiac ganglia, and of most (probably all) of the sympathetic system with its numerous centres and ganglia. In most cases this stimulation is too feeble to be measured or detected, except with instruments of precision.

Sulphonal depresses the reflexes by stimulation of Setchenow's inhibitory centre, and some other centres are stimulated (or overstimulated) by the drug. Its dynamic action has not yet been fully worked out.

Belladonna consists of a number of substances, each of which may have something to do in the total of dynamic effects from its administration. Besides tannin, etc., it contains at least two alkaloids,—atropine and the less-known belladonine. The latter is isomeric with hyoscyamine (*q.v.*), and may or may not have an identical physiological action with this alkaloid of hyoscyamus. Certainly it has an action upon the body different from that of atropine, with which it is associated in the crude drug. Aside from the interference of belladonine, however, the powerful toxic symptoms of large doses of atropine are often manifested from small doses of belladonna, owing to an increase of susceptibility in the patient. The idiosyncrasies towards atropine are manifested most often by symptoms identical with those produced by toxic doses, although minute quantities may have been administered. It must not be forgotten, however, that the primary action of this alkaloid and its salts is stimulation of every part of the sympathetic system and spinal cord. Medicinal doses cause overstimulation of some cells, toxic doses of nearly all, and minute doses which cause no objective phenomena perceptible to the unaided organs of sense may do so in the case of certain hypertonic cells.

Atropine, in addition to the symptoms which are familiar to every one, causes increased action of all unstriated muscular fibre; of intestinal secretions from increased peristalsis, although the secretion of the entire digestive tract is first decreased; of the cardiac ganglia, with resulting increase of heart-force; of the

inhibitory end-organs of the pneumogastric, decreasing the rate of the heart; of the vaso-contractor nerves, contracting the arterioles; of the dilator (radial) fibres of the iris; increased excretion of urea, the reverse action from overstimulation coming on at a certain and different stage for each of these, and of a few not at all. It will be plain after a little reflection that if, owing to greater susceptibility of some nerve-cells than is found as a norm, the reversal of action of some of these comes out of its proper order, then a complexus of symptoms very different from the usual one will be present.

Hyoscyamus contains hyoscyamine and hyoscine, which have quite different actions, besides an oil which may have some slight effect upon the body, and potassium nitrate. Hyoscyamine, atropine, daturine, and duboisine are isomeric, but with some differences of physiological action. Hyoscine may be a derivative of hyoscyamine.

Hyoscyamine, so far as known, has a dynamic action identical with that of atropine, but experiments so far made do not prove this beyond a doubt, in the opinion of the writer. It acts less energetically, even in the same direction, and effects which are not usually noticeable may become (by being magnified in certain hypersensitive cells) very marked.

Hyoscine is essentially a stimulant to the cerebro-spinal and sympathetic systems, overstimulation, of course, reversing the effect. It slows the heart by stimulating inhibition, although this action is so slight as to be difficult to measure in normal subjects. Used for a long time, it has produced muscular paralysis. It lessens the reflexes from overstimulation paresis of the cord, and its actions upon the numerous centres of the sympathetic system, which have been observed or are *a priori* probable, require great precision for their detection in normal subjects, although supersensitiveness in a given individual may, of course, magnify it in some direction.

Potassium nitrate is found present in hyoscyamus in sufficient quantities to affect in its own peculiar way persons with cells supersensitive to some part of its dynamic action.

Digitalis is another drug which is very complex in its dynamic composition. The chemists dispute as to the identity of some of the alleged active principles, and perhaps the same substance has been given different names by different discoverers. Whatever else it contains, the drug has the three following principles, which have each its own dynamic action: *Digitoxine* stimulates the inhibition of the heart and also the cardiac ganglia, and easily overstimulates that part of the sympathetic system which contracts the calibre of the renal arterioles. *Digitalin* stimulates the vaso-contractor nerves, energizing all unstriated fibre. *Digitalein* dilates the renal arterioles. *Digitaline* is not an alkaloid, as its name implies, but is a mixture of two or more of the active principles of digitalis, its composition varying in different samples.

Quinine is not absorbed from atonic or catarrhal mucous membrane; the heart-force is increased as the result of stimulation of the cardiac ganglia, which becomes overstimulation paresis from too dynamic a dose; the sympathetic system is depressed after a primary increase of functional activity; toxic doses kill by paralysis of the respiration, but the depression ordinarily is very slight.

Ipecacuanha causes depression, paresis, or paralysis of the pneumogastric nerve in doses of sufficient size.

Salicylic acid is irritant to the digestive tract; it causes stimulation and rapid overstimulation of the sympathetic system, including the cardiac ganglia and the roots of the vagi; toxic doses cause death by paralysis of the respiration; pathological epithelium in the kidneys increases the action of a given dose.

Iodides are excreted by all the mucous membranes, the saliva, and the kidneys; a chemical reaction at the point of excretion sets free irritant ozone and iodine.

Antipyrin is aromatic; it stimulates (and overstimulates) the reflexes; toxic doses cause paralysis of the respiratory centre.

Acetanilid is somewhat aromatic; lessens the reflexes; slightly depresses the motor part of the nervous mechanism, and energizes more or less all unstriated muscular fibre.

Paraldehyde, according to the force developed by the dose, produces depression, paresis, or paralysis of the respiratory centre from overstimulation.

Cocaine increases the reflexes and the activity of all parts of the sympathetic system, energizing peristalsis, bladder-contraction, and all unstriated fibre; but this easily becomes the depression of overstimulation. Applied locally to the eye, it produces paresis of the accommodation, which is slight under ordinary circumstances.

Hydrastis contains both berberine and hydrastine, the latter alkaloid being very different from the eclectic "hydrastin" and having a physiological action very similar to strychnine, but of much less energy and action. Berberine is irritant to the kidneys, and is found in many of the bitters. Hydrastis causes increase of

peristaltic action, stimulates the accelerator apparatus of the heart, and energizes the vasomotor nerves.

REPORT OF FOUR CASES WHICH ILLUSTRATE THE VALUE OF BACTERIOLOGY IN ABDOMINAL SURGERY.

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IN all abdominal operations upon women which I have performed during the past fifteen months, I have, whenever possible, had at hand facilities for making immediate bacteriological examination. The object of this examination is to determine the septic or aseptic character of any fluid which is found in, or which may have escaped into, the peritoneal cavity. The result of the examination decides the matter of drainage.

Before the adoption of this method I had drained all cases of cœliotomy in which purulent-looking material had escaped into the peritoneal cavity, either from the rupture of a tubo-ovarian abscess or from some other source. This method of relying upon bacteriological examination, followed at first with misgiving, has proved uniformly satisfactory, and now I decide with confidence the question of drainage, except in cases of hemorrhage, by such examination.

The following cases illustrate this subject:

Case I.—*Tubo-Ovarian Abscess, with Sterile Contents, and Chronic Endometritis.*—She had had septic infection after a miscarriage several years ago, and had since then suffered continuously with bilateral ovarian pain. Cœliotomy was performed, and the appendages were removed on both sides and the uterus amputated at the internal os. During the enucleation a tubo-ovarian abscess the size of a turkey's egg was ruptured on the right side, and the purulent contents escaped into the pelvis and were removed with gauze pads. The contents were immediately examined and pronounced sterile. The abdominal incision was closed without irrigation and without drainage. Convalescence was easy. There was no elevation of temperature and the woman has continued well.

Case II.—*Tubo-Ovarian Abscess and Abscess of Broad Ligament, with Septic Contents.*—She had had septic infection following a miscarriage one year ago, and since then had suffered with repeated attacks of pelvic peritonitis. Cœliotomy was performed during one of these attacks. All the pelvic contents were found matted together by inflammatory adhesions, and the thickened omentum was adherent transversely across the pelvis. Both tubes and ovaries were removed and the uterus was amputated at the internal os. An abscess cavity on the left side containing several ounces of pus involved the tube, ovary, and cellular tissue of the broad ligament. This abscess was ruptured and the pus filled the pelvis. It was examined and found to contain streptococci. The pelvis and lower abdomen were thoroughly washed out with warm water and drained with the glass tube. The woman had a slow, difficult convalescence, having a profuse discharge of pus from the drainage-tube, and after the first week a discharge of fæces, the result of intestinal necrosis.

Case III.—*Tubo-Ovarian Abscess, with Sterile Contents.*—The trouble in this case seemed to date from a labor nine years before. When cœliotomy was performed a tubo-ovarian abscess containing about one ounce of pus was found on the right side and a chronically inflamed, closed tube and ovary on the left. Both appendages were removed, the abscess being ruptured during enucleation. The contents were immediately examined and pronounced sterile. The abdomen was closed without irrigation or drainage. Convalescence was very easy.

Case IV.—*Double Pyosalpinx; Tubo-Ovarian Abscess, with Septic Contents; Endometritis.*—This woman had had septic infection following a miscarriage five years before. She had a tubercular family history and was suffering herself with pulmonary tuberculosis. She had had frequent attacks of pelvic peritonitis, during the last of which, following a criminal abortion, she was operated upon. All the pelvic contents were matted together by adhesions, old and recent; a tubo-ovarian abscess the size of a child's head filled the left and posterior portions of the pelvis, reaching half way between the umbilicus and the symphysis pubis. The tubes, ovaries, and the uterus to the internal os were removed. The abscess cavity was ruptured and the pelvis and lower abdomen were deluged with pus. Bacteriological examination was immediately made and a small number of streptococci were found. The pelvis was washed out thoroughly with warm water and drained with a glass tube. Convalescence was remarkably easy. The tube was removed in forty-eight hours and the tube-tract was completely closed within a week.

The surgeons who fear infection from all so-called pus cases would have used irrigation and drainage in the four cases here reported. Such

irrigation and drainage, being absolutely unnecessary in Cases I. and III., would be harmful. On the other hand, I think that Case II. would have died in the care of a surgeon who never uses irrigation or drainage in pelvic surgery. As it was, she recovered with difficulty. The reaction in Case IV. was so slight—the discharge from the tube and tube-tract never being purulent—that I think this woman would have recovered without drainage.

It seems that the method of bacteriological examination as at present employed indicates drainage, not in a minimum number of cases, but in a maximum number. There are probably a good many cases of pelvic abscess where the micro-organisms are of such character or number that drainage is not necessary. This is true when the pus contains only gonococci. Further work in bacteriology in conjunction with surgery will teach us much about this subject, and I think that we shall find that the number of cases requiring drainage in cœliotomy for suppurative pelvic disease will be diminished still further than has been done by the test which I have adopted.

THE ETIOLOGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

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THE infectious nature of tuberculosis and its production by the specific bacillus of Koch need no further confirmation at my hands, neither is it necessary for me to dwell upon the well-established axiom in therapeutics that in the treatment of disease the chief indication is the removal of the cause. I also avoid a review of our efforts and methods proposed and abandoned towards a method of treatment which the title of my paper indicates, and proceed at once to state that the introduction of tuberculin by Professor Koch four years ago is the first successful step in that direction, for with it begins a new era in the treatment not only of tuberculosis, but also of other infectious diseases.

The etiological treatment of diseases caused by pathogenic micro-organisms has for its foundation the fact that specific disease germs produce substances within the infected living organisms, and also in their own culture fluids, which are inimical to their own life conditions, and that infectious diseases thus become self-limited and cultures die out before the nutrient substances are exhausted, on account of the poisoning and destruction of the disease germs themselves by their own secretions or vegetation products.

The vegetation products of most disease-producing bacteria have this in common, that when introduced in sufficient quantities into the blood of a well or sick person, they produce, as a rule, symptoms of poisoning similar to the symptoms which we observe in the onset and course of all infectious and contagious diseases, being fever, with or without chill, together with general malaise, weakness and depression, loss of appetite, etc., the degree of the symptoms depending upon the quantity and rapidity of such toxic absorption.

The vegetation products of one kind of pathogenic germs are, however, not necessarily destructive to others, and upon the exhausted culture soil in which no further growth and development are possible for the particular kind, other kinds will grow and thrive luxuriantly, until they, too, have reached their limitation. This goes to show that each specific germ produces a substance or substances peculiar to its kind, which is destructive to the producer only, and which may, therefore, be accepted as a specific germicide. Under the formation and accumulation of this substance in the infected living organism, the development and growth of the germs are first hindered and retarded, and when present in sufficient amount the germs are destroyed and recovery takes place with or without immunity to future attacks. The continued presence for days and weeks of this albuminoid substance in the tissues, and especially in the blood, of the recovered subject prevents immediate recurrence of the disease, and the protection against reinfection lasts thus for a time until the germicidal albuminoid substance is eliminated. This effect must, however, not be mistaken for true immunity, in which the protection must last for much longer periods, and beyond a time when we could still believe in retention of germicidal products in the recovered patient.

In true immunity there must undoubtedly be a biological or molecular change in the tissue-cells, induced by the specific products of specific disease germs, a change which becomes permanent enough to last for years or a lifetime; and such true immunity is, for instance, not observed in diphtheria, erysipelas, or pneumonia, while it is present in variola, measles, whooping-cough, typhoid fever, etc. We do not yet know whether the substance which produces the immunity is at the same time possessed of germicidal properties, or whether in true immunity a separate and independent substance

is present with or without the germicide; either substance alone would account for the recovery, but the simple presence of a germicide cannot account for immunity lasting a lifetime, which can only be an "effect" of a past cause.

Behring, according to my views, does not produce true immunity from diphtheria in the horse, from which he obtains his curative serum, and the serum has no power to confer it to the person we inject with it, either for protection from or for the cure of diphtheria. In a sense all lower animals are primarily immune to human diphtheria. This fact, however, does not make their serum a curative agent any more than the serum of a human being can confer immunity from small-pox, although the person from whom it is taken does enjoy immunity against that disease.

What he does do is this: he establishes *toleration* to large quantities of the specific culture products, which contain toxic as well as germicidal substances, and the serum contains these products in proportion to the doses which the horse has been brought to tolerate. That it contains toxic products as well as those of a germicidal nature appears from the rise of temperature which follows the serum injections within the first twenty-four hours. The toxic substances may be more rapidly eliminated by the horse than the germicidal substances, and the latter may thus be in excess in the serum. Protection to the injected subject lasts only so long as the germicidal substance is present in sufficient quantity in the blood, and thus the preventive inoculation with Behring's serum for diphtheria places the subject in the same condition as though just recovered from the disease, and clinical experience confirms this view. But there is no immunity in the true sense of the word.

In the cure with serum the Behring method introduces germicidal albuminoid substances with more or less of toxalbumins, thus facilitating and anticipating the cure, as it occurs without specific treatment.

As to immunity from tuberculosis, this is still an open question, because we do not know that there is such a thing. So far we have only the evidence that guinea-pigs will outlive control animals if, previous to infection, they have received a number of injections of tuberculin, or of the extract from the germ itself, or of the antiphthisin obtained from the culture fluids.

The experiments made by Professor Koch and Professor Klebs show this fact, but they do not show that the modified and slower course of the subsequent tuberculosis is due to immunity, or to the presence of the albuminoid germicides which are contained in the injections preceding infection, and which may still be present in the blood when the animal is infected, a few days or weeks thereafter. Only after we have been able to protect the guinea-pig or other animals partially or absolutely from infection with living, full, virulent tubercle-bacilli, at a remote period from the protective inoculation, can we think of the possibility of obtaining immunity from tuberculosis.

It is quite different as to obtaining a cure with a specific germicide; its presence in the culture fluid is proved by the self-limitation of the living cultures, and the destruction of the virulency of the tubercle-bacillus by treating it with antiphthisin, outside of the living organism.

This effect is clinically corroborated by the constantly observed degeneration and gradual disappearance of the specific germ found in the expectoration of tubercular patients, and the local and general improvement which appears under the influence of such treatment.

Tuberculinum crudum, as produced by Professor Koch, contains the extractive matter of the germ itself, as well as the toxines, alkaloids, and ptomaines, in addition to the germicidal substances of the culture fluids, representing a concentration of ten times the entire culture. Its introduction into the human organism, even in small doses, causes the common but characteristic symptoms of poisoning with toxines and alkaloids. A certain amount of toleration can, however, be established, so that, although at first quite small quantities—as, for instance, one-tenth of a milligramme—may produce symptoms, in the course of several months fifty to one hundred milligrammes may readily be borne without disturbance.

A similar tolerance is, no doubt, established to the absorption of small quantities of toxines and alkaloids in tubercular and other chronic infectious diseases which are produced by the germs in the body of the patient; but if, in tuberculosis, we add even a small excess of toleration by the injection of crude tuberculin, the poisonous symptoms appear quickly; and this is the reason why tubercular patients are more sensitive to tuberculin than well persons, and therein lies the diagnostic value of the remedy. The toxalbumins, and, possibly, the germicidal albuminoid substance also, when introduced into the blood, give rise to active leucocytosis. The number of leucocytes is greatly increased, reaching its height in the course of from three to six hours. To this in-

crease is due the so-called local reaction of tuberculin, which adds a plus to the amount already present in the tubercular tissue, and the latter becomes stimulated, congested, and irritable, or even inflamed, according to the dose given.

With each dose of tuberculin a certain amount of the germicidal substance is introduced, and upon the latter depends the specific action of the remedy, while the irritating and poisonous effects of the toxines, so long as the doses are small and to the degree that toleration is established, do no particular harm. On the contrary, a minute dose produces stimulation of the tubercular tissues, and this effect is favorable in increasing the nutrition of the part, and in favoring phagocytosis and increasing the germicidal action of the blood.

The variability in the amount of toxines contained in different specimens of tuberculin, and the small doses permissible under all circumstances, restricted, of course, the more plentiful introduction of the associated germicide, and it was only after months of use, and after considerable tolerance was established to the toxines, that the specific effect of the remedy could be made to appear in its clinical employment.

Tubercular patients who already produced and absorbed toxines within their bodies in poisonous quantities were not suitable to the tuberculin treatment at all, for it would have been adding fuel to the existing fire to add still more toxines; and, indeed, experience demonstrated at an early period of its use that tuberculin was directly harmful in all cases with active or acute processes, for which the present toxic fever became the guide.

When, in the ordinary course of the disease, toleration to the toxines which become liberated by the tubercular process is established, the associated germicidal substances continue in their specific action, and thus come about periods of arrestment and improvement. During such periods the process becomes more and more quiescent, the bacilli are damaged or destroyed, and degeneration forms appear in the sputum; but then the formation of the germicidal products and their absorption become also diminished. After a shorter or longer period the temporary arrestment again disappears and new growths and new activities of the germs return, unless during the intermission the organism has been still further strengthened and fortified against them. If not, the patient, who has during the arrestment again lost his toleration for toxines, shows their renewed effect, the disease progresses, and so on until the patient is finally exhausted.

Studying a case of chronic tuberculosis in this light, especially if the whole course and history of the patient is fully recorded and before the student, he can hardly fail to appreciate the important *rôle* of the products of the specific germs in the course of the improvement, and also in the relapses of the disease.

In many cases, however, the disease does not remain purely tuberculosis, especially in the later, ulcerative stages; other pathogenic germs find entrance, and so-called mixed infections result. This, and the advance of the disease to other organs, as well as the structural degeneration in distant parts and their functional derangements, change the symptomatology of the individual case in many ways.

From this short consideration we find a logical explanation of the good and bad results which have followed the use of tuberculin, and the fact that I have had none of the latter finds its explanation therein,—that I excluded all cases with toxic fever from the treatment, and that my dosage was so gradual in its increase that I established and increased the tolerance of the patients to the toxines the remedy contains, and also to those absorbed from the tubercular lesion.

Antiphthisin, representing the germicidal properties and no toxines, has none of the toxic effects, and, in doses given to tubercular patients a thousand times greater than we can safely give of tuberculin, nothing unpleasant is experienced.

I have myself administered the remedy up to ten cubic centimetres per day with the happiest results, while my patients suffered not the slightest inconvenience.

Professor Klebs, in the first place, confirmed the curative action of tuberculin upon guinea-pigs early in 1891, but found that the remedy in the human being produced poisonous symptoms, and thereafter began his labor for the removal of the toxines. Many modifications were made and tried upon animals, and step by step the remedy arrived at its present form. Some of these modifications were also tried upon the human subject, and I myself used one, called tuberculocidin, two years ago, with good results. Its great cost at that time, however, prevented its more general use. With the final product, called antiphthisin, he has caused the entire and complete cure of tuberculosis in guinea-pigs; and he reports seventy-five, and more recently ninety per cent. of good results for all stages of pulmonary tuberculosis in the human subject. Of course, these good results do not all mean cures, especially not in the advanced stages of the disease. The details of the

whole experimental work, extending over three and one-half years, as also the clinical histories of the cases, are given in his recent work on tuberculosis.*

As to my personal experience with the remedy, I can state that I have made use of it during the last six or seven months in my institution. I regret that my limit of space forbids my giving the details of all the cases, of which I will relate only the first three or four.

CASE I.—Had been under treatment in my institution seven months, during which time his improvement was not satisfactory. On admission, he presented destructive changes in the right upper lobe and more recent infiltration of the left upper lobe, besides scattered localizations in other parts of both lungs, with history of hemorrhages and presence of the usual symptoms of fever, loss of appetite, and emaciation belonging to this stage. After several months of hygienic and dietetic management, the acute symptoms subsided in a measure, and he gained slightly in his general condition, but the disease gradually extended in the right upper lobe, posteriorly. Every attempt to give tuberculin at this period, even in doses of $\frac{1}{10}$ milligramme, caused aggravations of his symptoms, and I then bethought myself of the purified product of Professor Klebs, and used it. He bore the remedy very well, and dates his subsequent improvement from the time when he received it in larger doses. Under its use for four months, the right lower and left upper lobes cleared up entirely and the right upper lobe partially, so that in the latter, anteriorly, only fibroid changes in the locality of the cavity remained. His sputum showed absence of tubercle-bacilli several times before the expectoration disappeared entirely, and the patient was discharged, apparently cured, on August 1, with entire restoration of general health and, to use his own words, feeling as well as he ever did in his life. This patient contracted a severe cold in November, when slight, bloody expectoration occurred with the cough, which was evidently the result of his cold. He returned here, at my request, in the latter part of November, feeling entirely well, but there was still slight expectoration, probably from the still open cavity in the right upper lobe, and a few tubercle-bacilli were again found. A short course of injections caused both expectoration and bacilli to disappear, and he was discharged again with absence of all symptoms and enjoying perfect health.

CASE II.—History of chronic tuberculosis for four years, with recent extension and beginning destructive changes in right upper lobe. After three months' treatment in the institution he had not improved, and, proving entirely refractory to the minutest doses of tuberculin, this remedy was abandoned about the same time that the good results in Case I. seemed to justify compliance with his request that he also receive antiphthisin. When the administration of the latter remedy began he showed percussion dulness over the entire right upper lobe, front and back, with so many râles that the respiratory sounds were entirely masked. In the left upper lobe a dry, old cavity below the clavicle, bronchial expiration with small mucous râles on coughing, anteriorly; in supra-spinous fossa purely bronchial respiration, emphysema in right lower and anterior border of left lower lobe, tubercle-bacilli *ad infinitum*, in perfect form and well stained, in his expectoration. I had with him an identical experience as with Case I. He began to improve after receiving 500 milligrammes daily, and to a combination of tuberculin and antiphthisin he now showed toleration to such a degree that I reached 100 milligrammes of the former in the course of a few weeks without the slightest discomfort or reaction of any kind on the part of the patient. He received antiphthisin (up to 8 cubic centimetres) for four months, and was discharged on September 20. At that time the percussion note was practically normal on the right side. In the left upper lobe were a few fine râles, and the cavity much smaller than it was on admission.

Tubercle-bacilli at first seemed to increase, but soon diminished in number, and showed well-marked degeneration under the treatment. Only a few degenerated forms were found in the last specimen examined, which I suppose came from the old cavity.

His general condition left nothing to be desired, and I saw this patient in New York City in November, and found him in fully as satisfactory a condition as he was on his discharge; and in a more recent letter he reports still further increase in weight and strength and continued ability to attend to his business.

CASE III.—Was admitted January 30, 1894, with history of pulmonary tuberculosis,—consolidation of right upper and middle lobes, also left upper lobe, with great thickening of pleura in left lower lobe, so that the respiratory murmur was distant and scarcely perceptible over the seat of an old pleurisy. Catarrhal râles masked respiratory murmur entirely on right side in front, and cavernous signs existed below inner half of clavicle; bronchial respiration

* Klebs, Tuberculose. Hamburg und Leipsic: Leopold Voss, 1894.

with few catarrhal râles on left side wherever any respiratory sound was audible at all. Temperature 100° to 101° F., respiration 56, pulse 144.

Patient could not walk across the floor without great dyspnœa, and I only admitted him because he insisted, despite my unfavorable prognosis. Under careful management he improved a little, but beyond this no change occurred in the two months thereafter, when, observing the improvement which occurred in Cases I. and II., he begged me to let him try the new remedy, having previously declined again and again to use tuberculin in his case. His improvement from that time was uninterrupted. He gained, at first slowly, but afterwards much more rapidly, and on his discharge there was good resonance everywhere, excepting over the cavity on right side and in left upper lobe in front, at which locality there was still bronchial respiration. The expiration is also bronchial and prolonged in the left suprаspinous region, and the pleural thickening remains, but in a less degree. He has had a normal temperature for several months past, respiration 26, no dyspnœa, pulse good, ranging from 80 to 100. The patient continues to gain in his general health since his discharge. The tubercle-bacilli disappeared from the constantly diminishing expectoration, and the latter stopped entirely before his discharge.

These three cases are considered practically cured, and my opinion, based upon experience in nearly two thousand cases, is, that in none of these three cases would I have been justified in expecting the result obtained. Without the intervention of the antiphthisin I believe the cases were destined to follow an unfavorable course.

It was, perhaps, fortunate that my first three cases were so successful, since it gave me enough confidence in the remedy to justify me in negotiating with Professor Klebs for direct shipment and reduction in the cost, which at the beginning was two dollars per cubic centimetre, when obtained through New York agents.

Having obtained, through the courtesy of Professor Klebs, a much lower price (one-fourth the former cost), and receiving the remedy in large quantities directly from him, its use was extended to nearly all patients in my institution, regardless of stage, complications, and prospects; first, because the patients themselves became aware from their own observations of the rapid improvement the several other patients had obtained; and, second, because I was very desirous myself of enlarging my experience.

Since the arrival of the first large shipment, fifty to sixty other patients were put upon the remedy. Of these, a number are already discharged, all symptoms having disappeared, while, with the exception of five far-advanced cases, improvement followed in every instance, and of a character which I felt justified in attributing to the remedy.

One more (Case IV.), still under treatment, I desire to report more fully in this paper as being of especial interest. Mrs. A. B., wife of a tubercular patient, with good personal history, gave birth to a child in the spring. Nothing unusual occurred in her condition until three weeks later, when she began to suffer from slight cough. To this soon came continuous fever and loss of strength, which condition was treated for malaria; but the symptoms not subsiding, and upon the expectoration of some blood, her husband brought her to me on July 11 last. I found her temperature ranging between 101° and 104° F., never normal; pulse between 120 and 140, respiration 36 to 48; slight, bloody expectoration, containing tubercle-bacilli in endless numbers; patient was very weak, complained of headache and dizziness and prostration, had no appetite, bowels loose, occasional diarrhœa. Physical examination of the chest showed diffused, fine catarrhal râles throughout both lungs, with harsh respiratory murmur everywhere; good resonance, except over lower part of the left upper and upper part of the left lower lobe in front; there a slight dulness and more marked harsh inspiration than elsewhere.

Spleen distinctly enlarged, liver and other organs normal; blood examined for corpuscles and hæmoglobin gave of the former three millions per cubic centimetre, and of the latter fifty-nine per cent, a reduction of nearly half from the normal.

The diagnosis of acute miliary tuberculosis of both lungs seemed justified from the symptoms and signs, and this patient was put upon antiphthisin at once, and the doses were rapidly increased, so that by the end of two weeks she received 4 cubic centimetres per day. Its influence upon the temperature began to show itself in the first week, and by the end of the first month it rarely reached 101° F., and then only for a few hours of the day. It would take too much space to relate all the observations made in this case; suffice it to give her condition at this writing, five months after admission. Patient is able to be up, feels well and strong, has a good appetite and sleeps well, rarely coughs, and raises only a very little in the morning; has gained eight pounds in

weight, her color is good, and she thinks she is well enough to go home. The scant sputum still contains tubercle-bacilli whenever we can obtain it for examination, but they are few in number compared with the time of admission, and they are granular, fragmental, take the stain poorly, and show degeneration. Last blood examination shows an increase of nearly one and one-half millions of corpuscles and of twenty per cent. hæmoglobin.

Physical signs on right side have entirely disappeared, there are a few dry rhonchi over the lower part of left upper lobe and posterior over left scapula; the respiration there is still harsh, and in both localities there is slight relative dulness left.

I believe that I am not mistaken in my prognosis when I predict an entire recovery in this case, in which the outlook was as unfavorable as possible.

Three of the cases treated with antiphthisin terminated fatally; two were hopelessly advanced in their lung-disease, and the other case suffered from amyloid degeneration, which latter was the cause of death.

In each case a careful post-mortem examination was made. Case I. was admitted with acute dissemination of tuberculosis, occurring in the chronic course; a very large cavity existed, and occupied the entire left upper lobe. Under the treatment the temperature decreased steadily, the patient improved in flesh and strength, had a better appetite, and the laryngeal affection also improved. Death resulted abruptly by the supervention of pneumo-thorax after a severe spell of coughing, and the examination showed perforation of the cavity. Its walls were smooth, surrounded by fibroid tissue. No new or recent tubercular processes were found anywhere; only fibroid nodules were found throughout both lungs, embedded in air-containing parenchyma.

Case II. was practically a prototype of the first,—both had acute dissemination, with constant fever, a cavity of similar size and in same location,—and this patient also died of perforation of the cavity, and the post-mortem examination showed practically the same result. This case had become free from fever entirely when the accident occurred.

Case III. showed an entire recovery so far as his lung-disease was concerned; a cavity in the left upper lobe was entirely healed; the walls were smooth, fibrous, and pervious lung-tissue surrounded it; fibroid nodules were scattered through the previously consolidated lung portions, and in one small bronchus only a little caseous matter obstructed its lumen. The spleen, kidneys, and intestines gave evidence of amyloid degeneration, as also the liver, in which fatty degeneration was also well marked.

The caseous matter contained degenerated tubercle-bacilli in small numbers, and three guinea-pigs were inoculated with it. One guinea-pig died about the eighteenth day from exposure to cold; no evidence was found of tuberculosis either at the point of inoculation or in internal organs; the other two guinea-pigs remain well, and we are justified in believing that the tubercle-bacilli in the caseous matter were dead.*

These post-mortem findings in cases with acute and extensive lung-affections, and in all of which tubercle-bacilli were present in great numbers when they first received antiphthisin, are to me of the greatest interest, both as to the curative and germicidal action of antiphthisin, and more particularly as to the immediate cause of death, which could probably have been prevented by timely drainage of the cavities. Surely, in such cases, surgical interference before the perforations or the amyloid disease occurred would have offered a reasonable prospect, and I believe that in the future such cavities should be treated surgically. During their lifetime all three of these patients showed unmistakable improvement in the course of the local disease by diminution and disappearance of consolidated area, disappearance of râles, and improvement of the respiratory sounds, which was further attested by the disappearance of fever and the degeneration, diminution, and absence of the tubercle-bacilli in the constantly diminishing expectoration.

Referring now to the patients still under treatment, I am pleased that I can report marked improvement in every case, among which are some very severe ones; and while I am not at all unmindful that under careful institution management the majority of cases improve without antiphthisin, there is, nevertheless, an important difference in the nature of the improvement under antiphthisin which I cannot but attribute to the remedy.

First, I find that the remedy has an unmistakable influence over the fever, and that with increasing doses patients approach normal temperatures more quickly and, when obtained, more lastingly than without the remedy. Next, I find some remarkable changes locally: the percussion dulness becomes perceptibly less, and some portions clear up entirely, giving a full, deep resonance in localities where previously dulness was well marked. Correspondingly, bronchial

* One of the two other guinea-pigs has since developed evidence of tuberculosis.

and harsh respiration give place to puerile and later to a vesicular quality of respiration, while at the same time the vital lung-capacity increases, and patients notice this and speak of it themselves, without inquiry on my part.

Third, the sputum soon loses its purulent character and becomes less in quantity, the cough diminishes, while the tubercle-bacilli in the expectoration diminish in number* and show marked degeneration. I have never observed such a uniform influence upon the tubercle-bacilli heretofore, in many thousands of examinations made, and have never seen them to disappear entirely from the sputum so long as the same was still copious and of a purulent character, while under antiphthisin I witness this frequently and in a comparatively short time.

Only in the sputum which, by its nummular form, indicates its source to be a cavity the tubercle-bacilli are more persistent under the use of antiphthisin; sputum not having this character, and from the same patient, shows degeneration forms and diminution in number quite early, to their final disappearance.

Recent local tubercular processes in the pharynx and larynx are quickly and favorably influenced by rubbing the antiphthisin into their surface. In one case of small tubercular ulcer upon the skin, the same healed after two applications, after having been present several months. In a case of tubercular abscess over the sacrum, the abscess—about the size of an egg—was laid open with the knife and evacuated. Under subsequent local dressing with antiphthisin the undermined integument was preserved entirely, and the abscess closed with a healthy lineal cicatrice in three weeks. The pus and tubercular granulation-tissue evacuated contained tubercle-bacilli in great numbers. Under the antiphthisin no pus formed whatever, and the bloody serum which was discharged was free from bacilli.

Cases with so-called mixed infection, having septic fever, improve more slowly. The temperature, however, shows an unmistakable influence in these cases also, but normal conditions are not observed until the complication is overcome.

One of the earliest investigations contemplated by Professor Klebs to be made in our laboratory will be to determine the nature and relation of associated pathogenic germs in these cases and the symptoms which they produce, with the view of obtaining from their cultures pure germicides wherewith to antagonize them.

* The number of tubercle-bacilli is ascertained by counting all contained in one cubic millimetre of homogeneous sputum.

To this extent have we progressed in the etiological treatment of tuberculosis, and I believe the outlook is very bright indeed; it is especially so with the earlier and uncomplicated cases. These the general practitioner can treat with this remedy as soon as diagnosed. He can do so without the least fear of therewith injuring his patient, and its specific effects must appear in his hands even without the additional aid of climatic and institution management.

To those still sceptical I would say that I seek only the truth; that I am open to the adoption of better methods and of better remedies whenever my critics can point them out to me; that I am able to demonstrate my claims in the persons of the patients treated; and that I will invite those who cannot or will not believe to visit my institution, where the truth can easily be demonstrated by the cases there under treatment; and, finally, that my large experience with tubercular patients, and my great facilities for close observation, and the strictly scientific character of my work, as shown by my complete records, entitle me to speak on this subject with a greater degree of certainty than can be attributed to those who, perhaps, oppose me from theoretical reasons only, or who may have seen failure of the original tuberculin from faulty methods of application or badly selected cases.

POTASSIUM PERMANGANATE: A RELIABLE ANTIDOTE TO OPIUM-POISONING.

By James Stratton Carpenter, M.D.,
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IN a case of opium-poisoning recently reported I was able to adduce substantial evidence of the usefulness of potassium permanganate as an antidote to morphine, which was made more interesting from the fact that it had succeeded in overcoming most alarming conditions after the failure of the more usual methods to relieve the patient.

It has again been my fortune to see another case of opium narcosis, this time in an infant of eleven months, where equally happy results were obtained from the potassium salt when all hope of saving the little patient had well-nigh been abandoned.

The circumstances of the case were as follows: The baby had been crying a great deal, and its father thought he would quiet it by administering some "soothing drops,"—a patent medicine of whose nature he was altogether ignorant. It is not known how much was administered, but the infant was sufficiently

"quieted" to sleep for a number of hours, and so soundly that all efforts to awaken it were unavailing. The greater portion of the day had been spent before the parents became sufficiently alarmed to send for medical aid, so that when I reached the house the condition of the child was most alarming. Every evidence of profound opium narcosis was present, and the pin-point contraction of the pupils made the diagnosis certain, even had the admission of the parent as to his share in the proceedings not been immediately forthcoming. For four hours active measures were pursued, and warm baths, with cold affusions to chest and head, were at last successful in arousing the child to a momentary consciousness of its own discomfort, but it would immediately sink back again into the stupor from which it had just been awakened. The pupils continued contracted to pin-points, and failed to respond to light, conjunctival and corneal reflexes being abolished, the breathing became fainter, the pulse was scarcely perceptible, and every indication of a moribund condition was present when the saturated solution of permanganate of potassium was received that had been hurriedly sent for in the belief that it might become necessary to avert a fatal termination to the case through its use. I immediately injected 5 drops into the outside of the child's thigh, while at the same time almost hesitating to employ the remedy, so nearly moribund was the little sufferer after four hours of continued efforts towards resuscitation had been maintained. If anything may be said to exert a magical effect, this hypodermic of the potassium salt deserves thus to be spoken of in its results upon this little patient; for in an almost incredibly short space of time all the alarming symptoms were dissipated, the respiratory function improved, consciousness returned, and when I left the house, about ten o'clock that evening (I had been summoned about five in the afternoon), it was with the positive conviction, doubly strengthened by this second experience, that potassium permanganate was an undoubted antidote to morphine- or opium-poisoning, and could certainly be relied on where atropine might fail to bring relief. In this case there was an inflamed area of tissue following upon the use of the hypodermic injection, which persisted for several days, and finally broke down into an abscess, discharging a blackened purulent material, but not followed by any loss of tissue *per se*, as the limb quickly regained its natural aspect, save for a slight discoloration at the seat of puncture, which persisted for some time afterwards.

Considering these two cases reported by me, we find them each affording remarkable proof of the utility of potassium permanganate as an antidote to opium-poisoning, since, in each instance, the "atropine treatment" was pursued *prior to* the employment of the new remedy. There was no preconceived idea either as to its desirability in such cases, nor any belief as to its superiority over the recognized methods of treatment, since it was resorted to as a forlorn hope and when every prospect of saving the patient's life had been reduced to a minimum. It cannot, therefore, be urged that these cases would have recovered under a less unusual form of treatment; there is no question but that both patients would have died had there been no recourse to the potassium permanganate!

No prejudices, then, in favor of "conservative treatment" need be outraged by my advocacy of the new antidote to opium-poisoning; nor need the failure to explain its wonderful action in cases of this character, viewing it in the light either of a chemic or a physiologic antidote, be deemed sufficient reason for refusing it a most prominent place in that list of remedies—not so many but that a new one should be welcomed—for one of the most desperate conditions of the human economy when taken at the flood tide of the unopposed action of opium upon the system.

THE USE OF SCISSORS IN EXCISION OF THE TONSILS, WITH REFERENCE TO A NEW INSTRUMENT.

WRITTEN FOR PRESENTATION BEFORE THE OTOLOGICAL AND LARYNGOLOGICAL SECTION OF THE COLLEGE OF PHYSICIANS, PHILADELPHIA.

BY ARTHUR AMES BLISS, A.M., M.D.,

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HYPERTROPHY of the faucial tonsils has other relations to the comfort of the individual thus afflicted than are dependent upon the inflammatory attacks alone.

Pressure upon the base of the tongue, upon the pharyngeal walls, and upon the soft palate so interferes with the free movement of these elements in the production of vocalization as to cause want of clearness in the voice, whether in speaking or in singing. No one can fail to note how much of the tissue in overgrown tonsils lies hidden beneath the pillars of the fauces. Thus shielded, it frequently extends so high as to cover, more or less completely, the posterior

faucial pillar. This is especially the case in individuals having the narrow jaws of typical mouth-breathers. In such subjects this high distribution of the tonsil tissue may extend almost to the root of the uvula, being packed tightly between the faucial pillars, separating these latter widely, and, as a rule, attached to both pillars by firm adhesion.

In most instances of this character the covering of the tonsil is completed by a capsule, passing most usually backward and downward from the anterior pillar.

This type of hypertrophied and diseased tonsil is quite a common one, and, in the removal of such tonsils, the ring of the tonsillotome cannot surround the mass to be excised, but simply presses against the free surface. A certain amount of tissue may engage in the ring, and the shaving thus cut away completes the range of this instrument's action. Even where the free, projecting mass of the tonsil can be planed away more completely, the parts shielded by the faucial pillars remain still to annoy the patient by inflammatory attacks, while the pressure which these portions of the tonsil exert upon the soft palate and pharyngeal walls is scarcely, if at all, relieved.

True, we can burn away this deeper portion, but not until many *séances* have been held, each of which is as painful to the patient as a complete tonsillotomy, and each of which leaves him with a sore, disabled fauces for several days. The cold snare, carefully adjusted, will often remove more of the diseased and encapsulated tonsil than can be effected by the tonsillotome, but the lateral masses are still protected from its embrace by the adherent faucial pillars or by the capsule. The hot-wire snare takes away no more tissue and leaves a burned surface, from which the separation of the resulting slough causes some danger of secondary hemorrhage, slow healing, and not much result to show for it all. In not infrequent instances the anterior pillar of the fauces has become a thick, broad, fibrous band which completely envelops the anterior half of the tonsil, and, by a process, apparently, of contraction, has pressed and rotated the gland backward, so that whatever may remain of its free surface presents towards the posterior wall of the pharynx.

Such type of tonsil is most active in its tendency to take on inflammatory processes and to produce constant irritation, which affects the neighboring parts of the respiratory tract. The tonsillotome and snare are quite useless for the removal of such tonsils.

The process of destruction by electro-cautery puncture is very slow, tedious, and painful, and it is not rare for attacks of general tonsillitis to arise during the course of this method and to interrupt its continuance.

The instruments and methods, it seems to me, most to be desired for excision of the tonsils are such as to complete the procedure at one operation, or, in cases where both tonsils are greatly hypertrophied and diseased, two or three *séances* may be required. These instruments and methods should enable us also to excise the tonsils under ether without that element of difficulty and lack of precision which attend the use of cutting-rings and snares. This characteristic is of special advantage, as so often hypertrophy of the tonsils to the degree requiring excision is associated with hypertrophy of the lymphoid tissue in the post-nasal space. It is of decided advantage to be able, deliberately and safely, to complete the clearing of the fauces and posterior nares under one etherization.

The instruments which I have found most useful are the scissors shown in Fig. 1, used in conjunction with various sizes of Farnham's crocodile-jaw forceps. (See Fig. 2.) This form of scissors is adapted from Teet's nasal cutting forceps. The special features of the instrument are its long, powerful handles, the relatively short, strong blades, and a socket into which the shank of the lower blade falls as the scissors close. This socket arrangement presses the blades together and prevents them from being sprung apart when cutting through thickened tissue. Without it, the blades of an ordinary angular scissors will be thus separated, and will simply squeeze the part to be incised without cutting it off. The two instruments—forceps and scissors—readily serve as a tongue-depressor while the operator is at work, but in trimming out tonsils under cocaine the patient can, of course, assist by holding the tongue-depressor himself, when one is required. The tonsil tissue is grasped firmly by the jaws of the forceps, which will not slip away or tear out, as the volsella so often does. The scissors are then passed beneath the parts thus raised, and pieces of varying size, measured precisely as the operator desires, are thus trimmed away. Portions of the growth lying hidden beneath the anterior pillar of the fauces can be pulled out and excised with the same precision, thoroughness, and care that must always be exercised if we aim for the best results with the least danger of hemorrhage. Upon adults this can be done without ether, a five-per-cent. solution of cocaine being sufficient to cause local anæsthesia. I prefer to apply this by means of cotton pledgets

FIG. 3.

Position for operating upon the tonsils when the patient is etherized.

FIG. 4.

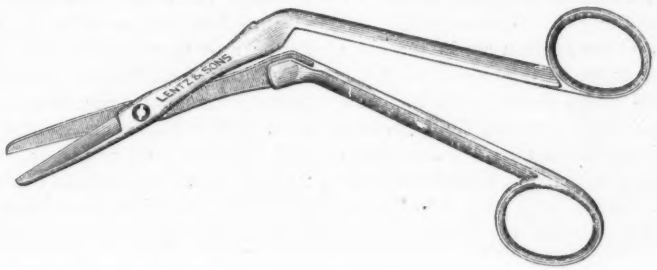
Throwing the patient forward in order to favor the escape of blood from the mouth.

FIG. 5.

Patient brought into semirecumbent position for re-etherization, etc.

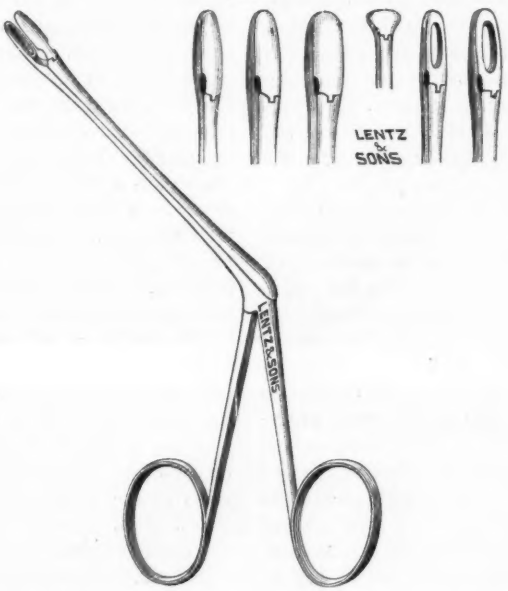
rather than by spray. I have frequently been able to use this method with quite young children; but where post-nasal adenoids exist I prefer to complete the post-nasal and faucial operation at the same time under ether.

FIG. 1.



In operating upon an anæsthetized subject, I have found it of advantage to use a position for the patient which I have never seen described. The patient having been etherized in the recumbent position, on a low couch, or operating-table lowered to its full extent, is carefully raised by the trained assistant to a sitting posture. Then the assistant, standing close by the right side of the couch or table, and resting his weight upon his right foot, places his left knee upon the couch, pressing the knee and leg firmly against the sacrum and back of the patient, who thus rests against the assistant's leg, abdomen, and chest. (See Fig. 3.) Thus the assistant has firm support, while he is enabled to hold the patient securely, giving by his own body firmness and easy movement to the otherwise limp and relaxed patient. The assistant is enabled also to hold the mouth-gag in position with one hand, while the other is free to support the patient's head or chest, or to hold napkins with ether, during the short intervals when etherization can be maintained. This position enables the assistant, by flexing his own body forward on his thighs, to throw the patient's body well forward, so as to favor the free escape of blood from the mouth or nares. (See Fig. 4.) At the same time it gives him power, simply by sinking back into a sitting position himself, instantly to bring the patient into a recumbent position at a moment's warning. (See Fig. 5.) I know of no method by which the etherized patient is so thoroughly supported, his position maintained, yet varied rapidly at the will of the

FIG. 2.



surgeon, the hemorrhage so thoroughly drained forward, and the operator in such good control of his field of operation, as by the method I have described. For operations upon the tongue, pharynx, and posterior nares it seems to me vastly to be preferred to the position of recumbency with extreme extension of the patient's head, as the parts to be explored and operated upon by the surgeon are in the same relation to the latter as they would be if the patient sat before him in the operating-chair of his office. For illumination, the light from a window, reflected by the head-mirror or direct, is, as a rule, sufficient. I have used the light reflected from a lamp held far off from the patient, so as to avoid any danger of fire. The electric head-lamp has also been used for this purpose. In removing the hypertrophied post-nasal adenoid tissue at the same time with the tonsil operation, I follow Dr. Harrison Allen's method of curettement with the forefinger of the left hand passed above the soft palate into the posterior nares, where it serves to guide and aid the action of a Farnham's nasal cutting forceps. This latter instrument, held in the surgeon's right hand, is passed back through the nares, and by this forceps the detached pieces of the growth are removed forward through the nares. For this procedure light is not an absolute necessity, as the work is done mainly by the guidance of the sense of touch.

Under ether the position described is without danger in operations performed upon individuals with whom ether can be used safely. This excepts the aged or persons known to have serious cardiac or arterial disease. I would not care to use this position in a case of chloroform narcosis.

In employing the tonsil scissors, it is necessary to hold them in the hand nearest to the tonsil to be operated upon; for instance, the operator's right hand when excising the left tonsil of a patient. This brings the blades well beneath the tissue lifted out by the forceps, and avoids the awkwardness and obstruction to the view which would be caused by crossing the hands,—a necessary position if the surgeon relied upon his right hand alone in trimming both tonsils. I have never had a dangerous or even an alarming hemorrhage when working by the precise method which I have endeavored to describe. In this respect, although more tissue is generally removed, I think that there is less danger of severe bleeding than may result from the single large gash of the tonsillotome. Yet is not the danger in tonsillotomy (of hemorrhage), by any rational method, an accident which, perhaps, we always dread, but seldom or never experience? In looking back over the volumes of the "Annual of the Universal Medical Sciences" for the last six years, it will be seen that Dr. Bryson Delavan has gone quite fully into this subject. Yet in these volumes, reviewing the medical literature of six years, Delavan refers to the reports of only twelve cases of hemorrhage after tonsillotomy. But the most important papers among these extracts are three: one by S. Hunter Mackenzie (*British Medical Journal*, March 25, 1893) (D 67, vol. iv., 1894, "Annual of the Universal Medical Sciences"), giving an analysis of two hundred and thirty cases of tonsillotomy upon patients between two and fifty years of age, in none of which a profuse or troublesome hemorrhage occurred. The second paper is by Désiré (*Gazette des Hôpitaux*, Paris, 1890) ("Annual of the Universal Medical Sciences," E 9, vol. iv., 1891). This compares the results of galvano-cautery puncture with tonsillotomy. He prefers this latter method, as does Mackenzie, Browne, Krause, Schroetter, Capart, and Gugenheim. Mackenzie, in many thousand tonsillotomies, has never had an accident. Browne has had but two slight accidents in many thousand operations. Krause has never seen an accident from tonsillotomy. Schroetter has seen but two cases of hemorrhage in many thousand operations. Massei has seen but four cases of moderately severe hemorrhage in eight hundred and fifty tonsillotomies. Capart has seen but one serious hemorrhage in more than two thousand tonsillotomies. There are thus collected, as Delavan states, about twenty thousand tonsillotomies in the practice of most reliable authorities, in which but nine instances are recorded of hemorrhage having occurred. The third paper is by Wright (*New York Medical Journal*, August 30, 1890), reporting a thorough search through the records of the last twenty-five years in the library of the Surgeon-General, Washington. He found reports of but thirty-one cases of hemorrhage. Two of these cases were fatal. The details of one of these latter only are given, mention being made of the fact that there existed an anomalous distribution of the internal carotid. Delavan remarks upon this paper (see E 11, vol. iv., year 1891, of "Annual of the Universal Medical Sciences"), "When Mackenzie, Browne, Schroetter, Gugenheim, Krause, Massei, and Capart together report about twenty thousand tonsillotomies with but seven cases of hemorrhage (Schroetter having stated that his two cases were not serious), thirty-one cases of bleeding

would represent, at the same ratio, about eighty-eight thousand five hundred tonsillotomies; certainly a strong argument in favor of an operation productive of so much relief." Perhaps an accurate estimate of the real number of cases of hemorrhage after tonsillotomy cannot thus be gathered, as doubtless many cases occur which are never reported; yet the experience of the authorities quoted should lead us to regard the accident of hemorrhage as among the unusual complications of tonsillotomy.

My experience with the special form of scissors described and with the methods I have indicated have led me to feel that the operation of excision of the tonsils, thus performed, is not a matter of chance in regard to the amount of tissue removed, the locality from which it is excised, or the hemorrhage which may result. On the contrary, the operation becomes a procedure of deliberation and careful measurement, in which the surgeon can estimate the extent of his field for operative work and confine himself to these limits. The first few incisions will indicate if we have to deal with one of those rare cases of hæmophilia, and excision can be discarded for other methods of work.

The surgeon is enabled to trim away all concealed portions of the diseased mass, thus relieving pressure upon surrounding parts, and leaves a smooth, even surface, which greatly favors a rapid process of healing.

February 14, 1895.

LABORDE'S ARTIFICIAL RESPIRATION.

MAREY (*La Tribune Médicale*, December 19, 1894) has reported to the Académie de Science the result of his investigations as to the value of Laborde's method of artificial respiration. He quotes Laborde to the effect that apparent death is brought about by failure of respiration and circulation, real death by cell changes. That the period of real death follows that of apparent death by a longer or shorter interval, and that if respiration can be again started before this real death occurs life will often be saved. Laborde has shown that tractions exerted on the tongue reflexly excite the respiratory muscles, particularly the diaphragm. On cutting the sensory nerves of the tongue these tractions failed to produce this effect; upon dividing the phrenic nerve, but leaving the sensory nerves unaffected, traction will also fail of its effect; hence the inference is clear that the benefit is mainly due to stimulus carried by the sensory nerves of the tongue and transmitted through the phrenic nerve to the diaphragm. Experiments on animals demonstrated the value of the method. At the present time there are more than one hundred cases reported in which the life of man was saved by this method. These cases are particularly noteworthy from the fact that in a large number of them other respiratory methods had been employed in vain. Good results have been reported not only by Laborde, but by many others. Marey finishes the report with the statement that Laborde has rendered a great service to humanity and to science.

SPRAINS AND THEIR APPROPRIATE TREATMENT.

PRIMROSE (*Canadian Practitioner*, December 15, 1894) holds that the aim of treatment for sprains is the early absorption of effused material and the prevention of adhesions. For the immediate treatment of a recent sprain pressure is of paramount importance. This should be applied as follows: The joint—say the ankle, for instance—is placed at a right angle (or, if possible, at less than a right angle) with the leg, then cotton-wool or ordinary cotton batting is applied evenly over the foot from the toes upward to the middle of the leg. The amount of wool must be considerable; loosely applied, it should be fully three inches in depth. Over this is applied the bandage from the toes upward, which is drawn as tight as possible. There is no danger of making too much pressure, provided there is sufficient cotton-wool. This usually alleviates pain immediately by affording pressure to the blood-vessels and keeping the part at rest. The bandage and wool are removed at the end of a few days, a week at the longest, and carefully instituted passive movement is employed; then the dressing is reapplied to prevent further effusion. In ten to fourteen days cotton-wool may be dispensed with and the support of an ordinary flannel roller substituted. The patient is able to use the injured joint for ordinary purposes after the lapse of about three weeks in the majority of severe sprains. In sprains of slight severity massage may be begun at once with excellent results, and in old sprains massage is by far the most appropriate treatment and indispensable in order to effect a cure. Heat and cold are at best temporary methods of relieving congestion and do harm if employed too long.

The Therapeutic Gazette

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Leading Articles.

THE RELATIVE SAFETY OF ETHER AND CHLOROFORM IN CASES OF RENAL DISEASE.

ASIDE from the very general difference of opinion as to the wisdom of using ether or chloroform for the production of anæsthesia in ordinary surgical cases, there exists a still greater divergence of views as to which of these two anæsthetics are the safest in cases where the kidneys are suffering from either functional or organic disease. Those who have had the most experience are generally able to recall to their minds instances in which death has followed an operation within a few hours because of suppression of urine, with the development of uræmic symptoms as a result of inflammation or congestion of the kidneys to such an extent that it was impossible for these organs to remove from the blood the effete products which they eliminate when in a physiological condition. Within the last year G. B. Wood has published the findings of an experimental research in regard to the elimination of ether by the kidneys and its influence upon these organs. From the results of his studies he believes that prolonged anæsthesia by ether is capable of causing marked congestion of the kidney, with cloudy swelling of the cells in the convoluted tubules, and he believes that very prolonged or repeated etherization may produce a desquamative nephritis. For this reason he thinks that ether should be given very cautiously, if at all, to persons whose kidneys are not in a normal condition.

This view of the danger of ether in anæsthetic quantities in renal disease has been generally accepted on a theoretical basis as the correct one by the more advanced surgeons and by recent writers upon therapeutics.

On the other hand, it is worthy of note that, in a recent series of clinical investigations, Wunderlich has thrown doubt upon the advisability of using chloroform for patients with renal disease, claiming that it is also capable of causing disastrous congestion and irritation of the renal structures. Still more recently, Alessandri, in *Il Policlinico* for June 15, 1894, has stated that, while the effects of chloroform upon healthy kidneys are practically *nil*, in patients with renal affections this condition of perfect safety cannot be said to exist, and he believes, further, that chloroform under these circumstances is to be avoided, if possible, and that prolonged or repeated anæsthesias by it in such cases are unjustifiable. It is evident, therefore, that both scientific investigation and clinical experience still further emphasize the point already well understood, that the presence of renal disease very greatly increases the danger of administering anæsthetics, and that no surgeon who has an opportunity to decide as to the wisdom of performing an operation and the time at which it is to be performed should think of undertaking such procedures until after the urine has been carefully examined on a number of successive days. The truth of the matter seems to be, that both ether and chloroform possess the power of distinctly irritating the kidneys, but it also seems to be undoubtedly true that as chloroform acts as an anæsthetic in very small quantities, i is always to be the anæsthetic of election where operative procedures are demanded in the face of renal complication.

Closely allied to this subject is the general question as to the advisability of using chloroform and ether, which has recently been widely discussed in Europe, but chiefly in Germany. We publish elsewhere in the Progress columns an abstract of a paper by Mikulicz, of Breslau,

which discusses this point, deciding in favor of chloroform and against ether for ordinary surgical purposes. The cases which are cited by this author as against the use of ether are some of them manifestly very poor supports of the position which he has taken. Thus, it is most probable, from the description given of the fifth group of cases in which ether produced serious effects, that the pulmonary œdema and pneumonia were due more to the operation of the surgeon for stenosis of the œsophagus than to any fault of the anæsthetic itself, and his statement that ether must be given with the same caution as chloroform is certainly not supported by the daily experience of hundreds of physicians in all parts of the world. We do not think, therefore, that Mikulicz's arraignment of ether is based upon scientific grounds.

There is another method of reaching erroneous conclusions concerning the action of chloroform when it produces a fatal result, and that is to record the death as being one resulting from primary cardiac arrest, simply because the anæsthetist or surgeon loses the pulse in the radial or temporal artery before respiration ceases. We have already discussed in earlier numbers of the THERAPEUTIC GAZETTE the question as to which of these vital functions ceases first in chloroform accidents, and we still think it will be found in the great majority of cases, where the records are correct, that the respiratory function is the one that fails first. This is proved by every experimental research so far made and in most of the clinical researches where erroneous results have been carefully excluded.

Our attention has been called to this matter by reason of a report of death under chloroform made by Bell and Easterbrook, in the *Edinburgh Medical Journal* for January, 1895, in which they state, "We have reported this case as an undoubted example of failure of the heart before respiration," although they admit that the respiration failed simultaneously with the heart. Recently we saw a patient who suddenly became pulseless at the wrist and at the temporal artery under chloroform, in whom the respirations continued, and had death resulted it would probably have been reported as a death from cardiac failure under this drug; but it so happened that, as the operation was upon the abdominal contents, the operator inserted his hand into the belly, and on feeling the aorta, found that blood-vessel pulsating quite strongly, and, by continuing the pressure, the patient, who was given the advantage of other modes of relief, speedily rallied. In other words, clinicians have no right to report a case of death under chloroform as resulting from cardiac failure simply because the radial pulse is lost or the cardiac sounds cannot be heard.

STRYCHNINE DELIRIUM.

THOSE members of the medical profession who have employed caffeine very largely in the treatment of cardiac and renal disease have recognized that large doses of this drug, continuously administered for a considerable period, developed in certain individuals what has been popularly called "caffeine craziness." In other words, the full medicinal doses required by the condition of the heart or kidneys have also been sufficiently large not only to produce an increased activity of the brain, such as is seen when coffee is taken in large amounts, but also have gone farther than this, and by the very cerebral stimulation produced temporary insanity. Within the last few years the medical profession has been employing in certain states what may be considered as massive doses of strychnine in the treatment of failing respiration or circulation, and has obtained therefrom very good results. It having been found that these full doses of strychnine acted favorably, when given in an emergency, we have been tempted to continue their administration where the symptoms were relieved but temporarily, and, as a result, have oftentimes been pleased with their effect. On the other hand, a sufficient number of cases have been seen in which cerebral disturbance has followed these large doses to put us continually on the lookout for such untoward symptoms. As a rule, he who administers large doses of strychnine in an emergency is on the *qui vive* for some twitching of the muscles of the forearm or other portion of the body as an evidence of the physiological action of the drug. While we believe that these symptoms are commonly produced by a single administration of the remedy, we are also confident that its continued administration in full doses frequently fails to produce these evidences of heightened reflex activity, and in their place causes a more or less active delirium, in which the patient frequently refuses to take his medicine, or develops the delusion that his attendants are conspiring to poison him or do him some other injury.

THE MURPHY BUTTON.

IN the *Medical News* (February 9, 1895) the inventor of the now famous anastomosis button analyzes the cases operated on with the

aid of this mechanical device, holding that there are now a sufficient number of cases from which to draw conclusions and valuable deductions for guidance in the future.

The button was used in twenty-seven cases of gastro-enterostomy, required for the relief of obstruction due to malignant disease. Nine of these cases perished,—four from exhaustion, two from imperfect operation (too small a button in one case, failure to press the button tight enough in another), and three from peritonitis due to infection at the time of operation. The conclusions drawn from these cases are that in non-malignant stricture of the pylorus the end of the duodenum should be united to the posterior wall of the stomach; in malignant stricture, pylorectomy should always be resorted to, if possible.

Cholecystduodenostomy was performed with the aid of the anastomosis button in thirty-eight cases, with only one death, this being due to continuous hemorrhage from laceration of the liver substance.

Fourteen cases were subject to button anastomosis after resection of the bowel for gangrene from internal obstruction; there was but one death, in twelve hours from exhaustion. There were twelve anastomoses following resection for gangrenous hernia, with two deaths, neither in any way dependent on failure of the button to play its part.

There were nine resections for fæcal fistula, with end-to-end approximation; all of these recovered. Murphy here states that the end-to-end approximation promises much more for the patient than does the lateral approximation.

Resection with end-to-end approximation was practised on thirty cases of malignant disease, with seven deaths. In one fatal case there was sloughing due to a too large button; in another there was gangrene of the bowel. As a result of the clinical experience here available, Murphy declares that the cicatrix caused by the use of the button does not contract, that there is no danger of obstruction from the button, and that extension of the pressure atrophy beyond the line of pressure does not take place.

In spite of adverse, in some cases bitter, criticism of the Murphy button, its use has become steadily more popular. The enormous saving of time which its use makes possible, and this at the period of operation when time is most valuable, would alone commend it. The facts that these buttons are not very expensive, are easily inserted, are not liable to cause complications, and give statistics far more favorable than are to be advanced in favor of any other method are convincing to the man who has not a pet method of his own. Perhaps the greatest compliment that Murphy can have paid him is to be found in the fact that all well-equipped hospitals and nearly all active surgeons have as a part of their armamentarium a complete set of the Murphy buttons.

CASTRATION IN HYPERTROPHY OF THE PROSTATE GLAND.

IT was in the fall of 1892 that Dr. J. William White began an experimental research, having for its object the determination of the value of castration as a means of causing atrophy of the prostate. The results of this research, together with a careful review of the literature, both experimental and pathological, bearing on the subject, were announced at the annual meeting of the American Surgical Association in June, 1893, and were published in the *Annals of Surgery* for August of the same year. Basing his opinion on these results, Dr. White advised castration as the safest and probably the most efficient operative treatment of bladder obstruction from prostatic hypertrophy.

In September, 1893, Ramm, of Christiania, reported two cases, both of which fully verified White's predictions. Other surgeons practised the operation, with results so prompt and gratifying that to one unacquainted with the experimental evidence they seemed truly incredible. The operation has since been performed on more than fifty patients. There have been no operative deaths, and even in the least successful cases there has resulted greater relief than could have been expected from any other operation. In the great majority of these cases there has been an almost immediate relief, not only from the frequent, urgent, painful urination, but also from the cystitis, the urine becoming healthy. This clinical evidence is enough to establish castration as the specific operation for prostatic hypertrophy, and indeed this fact is now generally conceded, as instanced by Mr. Moullin's statement on this subject in the last edition of his Surgery. It must be borne in mind, however, that castration will have no influence in reducing the size of a prostate enlarged because of acute inflammation or tubercular infiltration or malignant degeneration; nor will the operation exert the slightest favorable influence upon the course of urinary obstruction, except when this is due to true prostatic hypertrophy. Hence in advising the operation, and particularly in predicting to the patient the probable result of castration, the surgeon must be well assured that he has to do

with simple hypertrophy. When this condition is present, he can proceed to operation with full confidence as to the favorable result.

The large number of cases suffering from enlarged prostate, the ultimately unfavorable prognosis in these cases, the difficulty experienced in their management, and the large mortality and moderate relief attendant on all other surgical treatment,—these are factors which make the profession more than ordinarily ready to adopt a simple, safe operation which has been shown by White to be practically "specific." As to the credit attached to discovering and suggesting this operation, that rests solely with White. No one else has advanced even the shadow of a reasonable claim.

Reports on Therapeutic Progress.

TREATMENT OF CORNEAL ULCER.

ZEIGLER writes on this topic in the *New York Medical Journal* for November 3, 1894, and, after asserting that many cases of corneal ulcer are due to nasal disease, he says the treatment resolves itself into the simple matter of treating the nose, together with the application of a mild, soothing lotion to the eye itself. While making no pretensions to being a specialist in the treatment of diseases of the nose, the writer is, nevertheless, constrained to act on this conviction as to the nasal origin of corneal ulcerations and to apply the remedy accordingly.

As to the treatment of the nose, he has found it very necessary to use an alkaline and antiseptic solution to cleanse the nasal chambers. Dobell's solution is valuable for this purpose, but the best form is that known as Dr. Goodman's compound tablet of sodium silicofluoride, which can be dissolved in water as needed. This solution may be used two or three times a day in a constant spray atomizer. A syringe or bulb nasal douche will be preferable for use in the case of very small children.

The most important therapeutic measure, however, is the local application of compound tincture of benzoin (long known as Turlington's balsam) to the hypertrophied nasal mucous membrane, daily at first and then on alternate days. The writer's attention was first called to the advantages of this drug by Dr. S. MacCuen Smith some five years ago, and since that time it has proved itself to be *par excellence* the one therapeutic agent that will most promptly reduce the turgescent and hypertrophied turbinals and restore the perverted secretions to their normal condition. It is at once antiseptic, astringent, depleting, and stimulating.

This application is best made with absorbent cotton wrapped on the end of a wire applicator, dipped into the solution, and inserted far back into the nostril, until the lower portion of the mucous lining is well coated. It is then swept under the lower turbinated as it is withdrawn, in order to help reduce any swelling around the nasal orifice of the lachrymal duct and its terminal fold, known as the valve of Hasner. If the patient is a child, it should be laid upon its back on the mother's lap, with its head between the knees of the physician, when the application can be quickly made. If the pharynx seems much congested, a similar application of the benzoin will facilitate recovery. Of course, if the disturbance arises from any more serious naso-pharyngeal lesion, as polypus, septal spurs, enlarged tonsils, or adenoid vegetations, the patient should be promptly referred to the laryngologist for relief.

There may be some little smarting following the benzoin application and a copious flow of secretion, but this will only last for a few minutes. If, however, you desire to be somewhat milder and more elaborate in your treatment, you may apply a series of four solutions:

1. 30 grains of cocaine in 1 fluidounce of distilled water, to relieve pain and constringe the relaxed mucous membrane and blood-vessels.

2. 30 grains of antipyrin in 1 fluidounce of distilled water, to hold the tissues down for several hours, and thus maintain the comfort of physiological breathing.

3. Compound tincture of benzoin as the important corrective and remedial agent.

4. 30 grains each of camphor and menthol in 1 fluidounce of albolene, to pleasantly stimulate and leave behind a cool, soothing sensation.

After this treatment has been used for some time the cocaine and antipyrin may be stopped and the benzoin (or benzoin and camphor menthol) continued as long as it seems to accomplish its purpose. A persistence in the use of the treatment after the subsidence of the ocular symptoms may prevent a future recurrence of the ulcer, the liability to which remains so long as the nasal lesion persists. The treatment outlined above is equally efficient for the relief of nasal disturbances when associated with ocular lesions other than those of the cornea. It is also useful for the relief of acute rhinitis, particularly when associated with acute catarrhal conjunctivitis in the relation of a casual factor.

For the local treatment of the eye an anti-

septic and soothing lotion should be employed, consisting of,—

℞ Sodii biborat., gr. v;
Aq. rosæ (or aq. camph.),
Aq. destillat., of each, f℥i. M.
Sig.—Drop in the eye freely four times a day.

The eye should be carefully examined by separating the lids, and atropine instilled at the first visit. The atropine need not be continued if the pupil dilates freely. If there is marked blinking and fear of light, 2 grains of cocaine and ⅛ grain of eserine salicylate to 1 ounce of water may be added to the lotion or used in a separate solution. Hot stupes are often highly beneficial; they may be applied to the eye for fifteen minutes three or four times a day. Calomel or iodoform may be dusted on the ulcer. Fresh cod-liver oil is often useful as a local application. A pressure bandage will sometimes give relief.

The diet should be carefully regulated. The author's invariable formula for children is, "No tea, no coffee, no cakes, and no candy." Of these, coffee is by far the most harmful. It exhausts the vitality of the patient and irritates the whole alimentary canal more than any other article of diet. If the bowels are constipated, a few doses of calomel and sodium will usually regulate them. The phosphate of sodium, as recommended by Dr. H. C. Wood, is an excellent corrective, saline aperient, and cholagogue of great efficiency. The granular form of this salt is probably the most soluble.

An excellent tonic for these cases is that known in the traditions of Wills Hospital as "Dr. Goodman's mixture":

℞ Hydrarg. bichlor., gr. i;
Liq. pot. ars., f℥ii;
Tinct. ferri chlor., f℥iv;
Acid. phosph. dil., f℥i;
Syr. limonis, q. s. ad f℥iv. M.
Sig.—Take a quarter of a teaspoonful in water after each meal (the dose to be regulated according to age and circumstances).

The relaxed condition of the skin is best relieved by daily baths in salt water, accompanied by friction of the skin or massage, and followed by an alcohol sponging or a rubbing down in sweet oil or sweet-almond oil. Improved hygiene and a nutritious diet are necessary prerequisites to a permanent recovery. Prompt exercise is often of the highest remedial value. We may gain a point by combining exercise with play, as in the dancing class or in rambles through the country, both of which are especially attractive to children.

If this peculiar ocular irritability should persist in spite of the treatment instituted, or if corneal perforation is threatened, or if there is an excessive tendency towards sloughing keratitis, the case should be promptly referred to the specialist for cauterization of the ulcer, canthoplasty, or rapid dilatation of the lachrymal duct, one or all, as his best judgment may dictate.

To briefly summarize:

Simple corneal ulcer is a purely local inflammatory process, arising chiefly from infection by septic secretions and originating in lachrymonasal lesions.

To epitomize the treatment:

1. Treat the nose locally with compound tincture of benzoin and the use of a cleansing spray.

2. Use a mild antiseptic eye-wash to the eye locally, a mydriatic, if necessary, and hot applications when indicated.

3. Regulate the diet, give salt-water baths, and improve the hygiene generally.

THE EMPLOYMENT OF SODIUM BICARBONATE IN THE TREATMENT OF DISEASES OF THE STOMACH.

The *Revue Internationale de Mèdecine et de Chirurgie Pratiques* for October 10 publishes an article on this subject by M. DUJARDIN-BEAUMETZ, who remarks that the first indication of the employment of alkalies is found in Chomel's work on dyspepsia. He described all forms of dyspepsia, muscular or chemical, and he was careful to insist on the treatment of alkaline dyspepsia and of acid dyspepsia. For the latter, he laid stress on the usefulness of Vichy water and salts.

With regard to the use of sodium bicarbonate and its influence on the digestion, says the author, Jaworski, Gegel, and Abend maintained that it increased the acidity of the gastric juice. Dumesnil also arrived at the same conclusion. Hayem employed Winter's procedure, which tended to show that sodium bicarbonate might increase or diminish the acidity of the gastric juice, according to the dose administered and the time at which it was given. Small doses before meals cause an increase, while large doses taken after meals considerably weaken the acidity. In 1893, M. Linossier and M. Lemoine presented a very important paper to the Académie on the action of alkalies on the digestion. Their conclusions, based on a large number of analyses, were important,

and M. Dujardin-Beaumetz gives the substance as follows:

1. Sodium bicarbonate excites gastric secretion.

2. When the dose is small, the increase of acidity is slight and variable.

3. When it is a medium dose, the increase of hydrochloric acid is considerable.

4. When the dose is large, the period of excitation is prematurely arrested.

5. The excess of hydrochloric acid varies according to the doses, reaching its maximum with small doses in two hours, with medium doses in three hours, and with large doses in four hours.

6. The bicarbonate should always be given an hour before eating.

7. At the beginning of a meal the administration of the bicarbonate appears to suspend the secretion of pepsin. After the meal the exciting action becomes attenuated.

8. Sodium carbonate also gives results somewhat analogous to those of sodium bicarbonate. These results, says the author, are of much importance, although they have not been entirely admitted by all experimenters.

According to Hayem, sodium bicarbonate stimulates the digestion, and the so-called excitation in the secretion of the gastric juice results from this fact, "that the processes of the stomach having progressed more rapidly, the maximum of the chemical acts is attained sooner. In reality, the employment of sodium bicarbonate always diminishes the amount of chlorides in the urine and tends to produce a depression of the processes of the stomach, not always at the moment of recovery, but subsequently."

With regard to clinical results, when three ounces of Vichy water are taken in two doses, at an interval of half an hour, also when the dose is doubled, the acidity of the gastric juice is increased. Here the dose of sodium bicarbonate does not exceed 8 grains, for Vichy water contains on an average sixty grains of bicarbonate in a pint. The author thinks that the remarkable action of Vichy water in intestinal putridity and the secondary infections which result from it, particularly infectious icterus, results from the same fact,—that is, from the increased acidity of the gastric contents. One of the most powerful antiseptics is hydrochloric acid, and one can understand that the increase of this acid constitutes an essential element of intestinal antisepsis.

There is another factor—the catarrhal element—which may be mentioned. Excess of hydrochloric acid is, in a large majority of cases, a matter of irritation or of congestion of the gastric mucous membrane, and in this case the alkaline waters act as a dressing to the inflamed mucous membrane, having qualities comparable to those of blood-serum; they have an effect, in contact with the mucous membrane, in causing osmosis, quieting and relieving congestion.

With regard to Reichmann's disease, he himself maintained that a cure was impossible, but Dr. Dujardin-Beaumetz thinks that this assertion is wrong. He recognizes the difficulties attending the cure in the last stages; but, if it is taken in time, he says, it is curable, and the curative agents are the alkalies and the alkaline waters. In this disease the administration of the dose must be modified. It should be given during the meal or four hours afterwards. Sometimes the dose must be increased, and in this case Vals water must be employed, as it contains one hundred and thirty-five grains of sodium bicarbonate to the pint, or the bicarbonate itself may be given in doses of from 15 to 60 grains.

The author often associates the bicarbonate with intestinal antiseptics, as follows: salol, benzonaphtol, and sodium, each, 150 grains. This is to be made up into thirty capsules. In cases of hyperchlorhydria he increases the sodium bicarbonate to 300 grains and decreases the salol and benzonaphtol, each, to 75 grains. One capsule is to be taken during the meal and another four hours after.

M. Dujardin-Beaumetz concludes that,—

1. In chemical dyspepsia, in cases of hypochlorhydria, the dose must be given an hour or half an hour before eating, and in hyperchlorhydria during the meal or from three to four hours afterwards.

2. In muscular dyspepsia, when there is a tendency to stasis or to dilatation of the stomach, the dose should be given during the meal or an hour afterwards.

3. That the best alkaline waters to be employed in the treatment of diseases of the stomach are those containing sodium bicarbonate.—*New York Medical Journal*, November 3, 1894.

THE TEMPERATURE AS A GUIDE IN THE ADMINISTRATION OF QUININE IN MALARIA.

WILLIAMS relies upon the temperature as a guide to the use of quinine in malaria, so he asserts in the *Boston Medical and Surgical Journal* for November 15, 1894.

Malaria has recently been so prevalent in and around Boston that the author calls atten-

tion to the treatment of this disease by the intermittent administration of quinine, with the temperature as a guide. What he presents confirms his experience in a series of eighteen cases treated at the Boston City Hospital in the summer of 1892. The cases considered in this paper include those that came into his service at the hospital between June 1 and October 1, 1893, twenty-one in all: tertian, ten; quotidian, nine; irregular type, two.

In all these cases the diagnosis was established by finding the plasmodia in the blood; sometimes more than one examination was required to detect them. As a rule, fresh specimens of blood only were examined, but in some cases the dried blood was heated and stained. All suspected cases were examined, likewise a number of cases of typhoid fever, but no case of well-marked typhoid fever with plasmodia was found. Before the patients were discharged from the hospital the blood was again examined for plasmodia, and hæmoglobin determinations were made both after entrance and before discharge. Four-hour temperature charts were kept during most of the time that the patients were in the hospital.

The patients came chiefly from Boston or its neighborhood, but there was one each from Pennsylvania, New York, Virginia, and South Carolina, and two from Central America (these two happened to be the only ones in which the crescentic forms of the plasmodia were found). The pigmented forms were those usually found, and in a few cases they were associated with hyaline or crescentic forms, or both; in two cases hyaline forms occurred alone and in one case roseate forms.

Two of these twenty-one cases were sent to the hospital with a diagnosis of typhoid fever and one with that of spinal meningitis. The latter was of special interest. When C. E. entered the hospital he gave a history of illness for two weeks, with pain in the head, and was in a dazed, stupid condition, repeating questions over and over before answering them. He had no chill at any time while in the hospital, and gave no history of any chill. There was nothing in the morning or evening temperature chart during nine days to suggest malaria, but a four-hour chart showed a rise in temperature to nearly 100° F. every other day during four days. The spleen was somewhat enlarged and the patient anæmic. The blood was examined and the ordinary pigmented forms of the plasmodia were found, and also the crescentic forms. The case proved to be an irregular type of malaria. It was learned later that the patient had just arrived from Central America, and his illness began when three days out of port. Under the administration of quinine and iron the hæmoglobin increased from fifty to seventy per cent. in eleven days.

Following the rule devised by Dock, 15 or 20 grains of quinine in solution were given in the cases under consideration during the decline of the temperature, and repeated on the seventh, fifteenth, and twenty-second days without reference to the temperature. If a rise in temperature occurred on the first or second day after the first dose was given, a second dose of 10 to 15 grains was administered when the temperature was falling. In six of these twenty-one cases a rise occurred on the second day, and in these the second dose was given in the manner described. These six cases were quotidians; in none of the tertians was there a rise of temperature after the first dose.

Anæmia was usually marked; generally from fifty to seventy per cent. of hæmoglobin was found in the blood, but in two cases it was as high as ninety per cent. It is well to give iron in these cases; the writer's patients had 5 grains of citrate of iron three times a day.

In contrast to this case is that of J. G., who was sent to the hospital with a diagnosis of malaria. He gave a history of chills at a certain time daily. After his entrance to the hospital his temperature rose daily to 103° or 104° F. No plasmodia were found in the blood, and quinine had no marked effect on the temperature. Malaria was excluded. This proved to be a case of pulmonary tuberculosis.

The essential thing in treating malaria is, of course, to give quinine, and to give it in solution or powdered in capsules; but the cases, thirty-nine in number, which the writer had treated by Dock's method during the years 1892 and 1893 at the hospital, as well as those treated in private practice, have, with one exception (quinine had been given to this patient by another method before the author saw him), yielded more promptly with far less quinine than the cases in which the quinine was given in divided doses during the day for several successive days, or when it was given with reference to the chill. He has seen cases in which more than 30 grains of quinine were given per day for some days by the physician in charge before the chills were checked, and a number of cases in which the quinine had been given to the amount of 16 grains a day for several days before the patient was relieved; similar cases were invariably relieved promptly when the quinine was given in the way here advocated.

Further, under the use of this method there was a smaller percentage of cases in which the chills occurred again some time after treatment had ceased; there was less cinchonism, usually none at all. There is less chance of any deleterious effect upon the ears, less quinine is needed, and the patients are not obliged to remain so long in the hospital. Many cases treated by this method require to be in the hospital two or three days only; they might then be sent, for blood examinations and for the doses that should be given on the seventh, fifteenth, and twenty-second days, to the outpatient department. It would be well to have the quinine administered there, as the patients have not always the money necessary to buy quinine, nor is it always put up in the right way. Malaria may, of course, return if the patients go back to a malarial district; in such cases weekly doses of 15 grains of quinine are probably a better preventive than smaller and daily doses.

In using Dock's method of treating malaria —namely, the intermittent administration of quinine with the temperature as a guide—more care is required to administer the first dose at the proper time than by the ordinary methods; but, as already indicated, the writer has succeeded much better and with the use of much less quinine with this method than with any other. The best results are not obtained if quinine has first been given to the patient in the ordinary way when suffering from an attack, before this method is employed. It is requisite to the best success of this method to begin with its use.

LYSIDIN.

GRAWITZ, of Gerhardt's clinic (*Deut. Med. Woch.*, October 1, 1894), has used this remedy in gout. It has a much more powerful solvent action on uric acid than piperazin. He records two cases of characteristic gout in which lysidin gave the best results. The drug was given in doses varying from 1 to 5 grains in the day, with occasional intermissions. An elaborate investigation was made at the same time into the metabolism in these cases, the intake and the output being carefully estimated. It was found that there was no increase in the excretion of uric acid. In the first case the drug was omitted for some days, and the pains returned, but the patient rapidly improved again as soon as the lysidin was resumed. In the second case tophi were seen to disappear under the treatment. In a case of genuine rheumatism the drug was without effect.—*British Medical Journal*, November 10, 1894.

ON THE VALUE OF REPEATEDLY WASHING OUT THE STOMACH AT SHORT INTERVALS IN CASES OF OPIUM- OR MORPHINE-POISONING.

HAMBURGER, in the *Johns Hopkins Hospital Bulletin*, contributes a paper with this title.

Among the many researches that have been made on the physiological, therapeutic, and toxicological properties of morphine since its isolation by Serturner in 1817, those of Marme, Leineweber, Alt, and Tauber, demonstrating its elimination by the gastric mucous membrane, take a leading place. The medical profession in general does not seem, however, to be familiar with the practical applications that may be made of this discovery, and it is worth while to record the following case of opium-poisoning, in which a chemical examination was made of the urine and of successive stomach washings, especially since the results agree with those found by the above-mentioned investigators in their experiments on animals.

On the evening of May 2, 1894, six hundred and sixty cubic centimetres of a sherry-red fluid were sent from the hospital to the pharmacological laboratory, the liquid being part of the washings of the stomach of a Chinaman, Lee Hee, who had attempted suicide.

A report was requested as to the kind of poison that had been taken. The fluid was clear, with a few bits of orange pulp floating in it, and it smelled faintly of crude opium; it was filtered, and gave the characteristic meconic acid reaction,—namely, the red color with ferric chloride or ferrous sulphate, which persisted on the addition of hydrochloric acid and also when boiled. A second portion of the filtered fluid was made alkaline with sodium hydrate, shaken up with ether, the ether removed and evaporated, the yellowish-white residue from the ether dissolved in a little acidulated water, and this solution examined for alkaloids. It responded perfectly to the following reagents: platinic chloride, iodine in potassium iodide, sodium molybdate in sulphuric acid (Frohde), potassium-bismuth iodide, and potassium-mercuric iodide. The presence of meconic acid and of alkaloids being demonstrated, it became evident that poisoning was caused by opium.

Lee Hee is supposed to have taken the opium at about 10 A.M., and the quantity taken we estimated to be at least 10 grammes, judging from the amount that still remained in the little jar, which was known to have been full when the suicide was attempted.

About half-past five Lee Hee was brought

into one of Professor Osler's wards in a comatose condition, and it was evident from the state of his respiration and circulation that he was not likely to recover. At this time the stomach was first washed out, and the process was repeated until the physicians in charge had reason to think that there was no longer any opium in the stomach. A second lavage was made at 8 P.M., and a third at half-past eleven, a quarter of an hour before death. The fluid secured in these last two washings was colorless, and from this fact it may be concluded that all the crude opium had been removed by the first washing, though, unfortunately, this conclusion could not receive positive proof, since the last portion of the first washing was not kept separate from the rest and chemically examined. All three washings were examined for opium and morphine, and the results, which will presently be given, at least demonstrate the practical value of repeated stomach washings, even after all ordinary signs of opium, such as color and odor, are no longer found.

At 6 P.M. 75 c.cm. of urine were removed by the catheter and submitted to a chemical examination by Landsberg's method for the detection of morphine in the urine. The residue finally obtained was a mixture of urea and morphine. No difficulty was experienced in identifying the former; it appeared in the characteristic four-sided prisms with pyramidal ends. In addition to these crystals of urea there were seen numerous very small rhombic prisms. Whether the latter were certainly crystals of morphine was not determined; nevertheless, the chemical tests demonstrated the presence of morphine in considerable amount. This difficulty in separating morphine from urea is not peculiar to this case, but is due to the fact that both behave towards solvents in much the same way. Control tests showed that urea does not interfere with the following morphine reactions. A minute quantity of the residue dissolved in water and treated on a porcelain dish with a drop of ammonium molybdate gave a yellow precipitate, and the addition of a drop or two of concentrated sulphuric acid caused that beautiful play of colors—violet, blue, and green—which solutions of morphine give under the same conditions (Frohde). A fragment of iodic acid added to the diluted residue was reduced and the free iodine recognized by shaking with chloroform. In this way the presence of morphine in the urine was demonstrated. In the present case, therefore, there was no difficulty in proving the elimination of at least a part of the ingested alkaloid through the urine. Yet there is probably no point in the physiological history of morphine which has given rise to more controversy than its presence or absence in this excretion. The controversy involves not only the immediate experimental results, but the more general problem of the fate of morphine in the body. Thus, some observers, after demonstrating that the alkaloid was present in the urine, claimed that it passed through the body unchanged; others, failing to find it, argued that it suffered a destructive oxidation and could not be demonstrated as morphine in the urine. But it is now generally admitted that after large doses of the alkaloid a small quantity appears in the urine.

It is in the stomach, however, that the elimination of morphine proceeds more actively. The practical importance of this gastric excretion will be evident upon considering the results of the stomach washings in the present case.

Of these there were three, as already mentioned. The first was the sherry-red fluid giving meconic acid reactions, and upon treatment by the method of Stas, alkaloidal reactions. This fluid was treated like the urine and a similar brown residue was obtained. This residue was dissolved in water, acidulated with hydrochloric acid, and again evaporated. During this evaporation a white precipitate separated out, which, upon examination, was found to be calcium phosphate, one of the inorganic constituents of opium. Having removed this salt, the residue was dissolved in warm absolute alcohol and allowed to evaporate spontaneously. Morphine crystals of a definite type were not obtained, but the solution gave beautiful morphine reactions, reducing iodic acid, responding to Frohde's reagent, and giving a pink color with sulphuric and nitric acids (Husemann).

As already stated, it was believed that all the opium was removed during the first washing, and the fact that the second washing came out colorless seems to confirm this view. Nevertheless, the latter liquid gave fine alkaloidal reactions, but did not respond to the tests for meconic acid. In other words, at the first washing the ingested but unabsorbed opium was removed; between this first lavage and the second the alkaloids had accumulated again. How? It could only have been through an excretion by the gastric mucous membrane. Nor did the elimination of the poison stop at this period, for the third washing, made several hours later, colorless also, still gave good reactions.

The meaning of these results must be clear. They point to the excretion of the alkaloids of

opium by the mucous membrane of the stomach, and suggest a practical application of this fact. If, as has been shown, these alkaloids, and morphine in particular, are excreted into the stomach, then washing this viscus repeatedly and at very short intervals, to remove the alkaloids as fast as they are eliminated, must certainly be a life-saving process, whether the poison has been taken by mouth or hypodermically. Poisoning by the latter method has not, so far as can be ascertained, been treated in this manner, in spite of Alt's demonstration of the presence of morphine in the stomach washings of men who had received 3 centigrammes of the hydrochlorate subcutaneously. The quantity of the alkaloid capable of being removed by repeated washings has been estimated at almost one-half. Tauber also recovered 41.3 per cent. from the fæces of dogs to which morphine was administered subcutaneously, but where the stomach had not been washed out. Alt has ascertained that for dogs, doses of more than 10 to 12 centigrammes of morphine pro kilogramme may be considered lethal; 17 centigrammes pro kilogramme almost invariably caused death. On the other hand, if, immediately after the injection, the stomach was washed and the lavage continued for forty-five minutes, then 10 to 12 centigrammes pro kilogramme, never produced serious symptoms; and, indeed, with 17 centigrammes, and even 20 centigrammes pro kilogramme, the symptoms of poisoning were not so severe as when 12 centigrammes were administered without repeated washing. Two dogs were saved after the injection of so large a quantity as 24 centigrammes pro kilogramme. This evidence goes to prove that the excreted morphine is reabsorbed and that it still has toxic properties; and may not the frequent relapses following apparent recoveries from overdoses of morphine also furnish proof of such reabsorption? By a continuous lavage the exchange that goes on between the gastro-intestinal mucous membrane and the general system would be interrupted, and in proportion as the alkaloids excreted by the mucous membrane are removed the effects of their reabsorption would be avoided. Conformably to the results of Alt's experiments, the lavage should be repeated at short intervals, and the sooner this can be done after the opium or morphine has been taken the better. In the cases cited in this paper no successful outcome could be anticipated, because too long a time elapsed between the taking of the opium and the beginning of the treatment.

In connection with this subject it may be well to repeat Kobert's suggestion, that a chemical examination of the fæces should be made in cases where the morphine habit is suspected, but is denied by the patient, and where for various reasons it is difficult to secure conclusive evidence of the fact in other ways.

THE USE OF PILOCARPINE IN THE TREATMENT OF ACUTE ARTICULAR RHEUMATISM.

In the *Journal des Sciences Médicales de Lille* there is an article on this subject by M. DRAPPIER, of Ardennes, in which he says that since the introduction of salicylated preparations in the therapeutics of this disease all other treatments have been completely abandoned. Sodium salicylate, which is the most frequently used, causes a rapid diminution of pain, fall of temperature, and disappearance of œdema of the articular tumefactions. Its abortive action has made it the preferred remedy, the specific in this disease. In certain cases, however, it gives rise to toxic symptoms, so that it is impossible to continue its use, and it is necessary to resort to other means to alleviate the patient's sufferings.

M. Drappier relates the following case in which pilocarpine was employed with good results: A man, forty-five years old, suffered with articular rheumatism for ten years. In the beginning the salicylated medication was successfully used, but gradually the action of the medicine lessened, and from 120 grains the doses were progressively increased to 225 grains, and on one occasion the patient took 270 grains, which produced only a very slight sweating and did not bring any appreciable alleviation. Very soon this immoderate use of sodium salicylate provoked such gastric intolerance that its further employment was impossible; it was used also in injections, but without success. Antipyrin was used, but no good results were obtained. Vapor baths or hot-air baths were then prescribed, but they had little effect, and finally hot poultices constituted all the treatment until March 2, when the patient had a very acute and painful attack. The author then made an examination, and found that the right arm and the left wrist were red and very much tumefied. The least movement was impossible, on account of the pain it provoked. Before the author's visit the patient had tried the sodium salicylate, but it had brought on vomiting. M. Drappier decided to try pilocarpine, and he gave a subcutaneous injection of $\frac{3}{20}$ grain of nitrate of pilocarpine. The result was abundant sweating, and that night the patient slept for a short

time. On the following day the pain returned, but was less intense; in the evening another injection was given, and the patient was able to sleep all night. On the fourth day the pain disappeared, but the treatment was continued two days longer, at the end of which time no inflammatory or painful symptoms were observed. The patient had no relapse, and was now entirely cured and able to work.

The employment of sudorifics in the treatment of acute articular rheumatism, says M. Drappier, is not new; they have been given in the form of baths or drinks. Gubler has also made some trials with jaborandi and pilocarpine, but these attempts have not been renewed. Meanwhile, the preceding observation proves that this remedy should not be ignored when the employment of a salicylate is impossible. Of course, says M. Drappier, no conclusion can be drawn from an isolated case, and it cannot be said that pilocarpine is an infallible remedy in rheumatism; but the facts just cited prove that in certain cases its employment may be of real use.—*New York Medical Journal.*

AN OLD BUT FLOURISHING BLUNDER IN MEDICAL CHEMISTRY.

FOLKARD, in the *American Journal of Pharmacy* for November, 1894, uses this title for an article, in the course of which he says, "Lithic urate is more soluble than any other of these salts (the urates); hence lithia water is occasionally prescribed to gouty patients and to others who suffer from a superabundance of uric acid."

The above is an extract from p. 773, Part III., of Miller's "Elements of Chemistry," fourth edition, published in 1869, and there is sufficient semblance of truth in it to mislead those who are able to devote but a few months to the study of chemistry, as is the case with the majority of medical students.

Although the paragraph quoted was omitted in the new edition published in 1880, it would seem that no attention was called to the subject, for sufferers from a too abundant secretion of uric acid have been treated up to the present time on an erroneous assumption, proceeding from the "little knowledge" which is admittedly so dangerous, and which is also, doubtless, responsible for the practice of exhibiting chlorate of potassium in cases of blood-poisoning, "to oxidize and destroy the poison in the blood," whereas every chemist is aware that in an alkaline solution like the blood the chlorate of potassium is practically as stable and inert as the chloride or as common salt.

In these remarks the writer disclaims the idea of censuring the members of the medical profession, because these are chemical subjects, and if blame be due anywhere, it must undoubtedly fall upon chemists for neglecting to point out to the members of an allied profession the absurdities involved in these two cases.

There is, however, one great consolation for the uric acid and pyæmic patients who have been wrongly treated,—viz., that both lithia water and chlorate of potassium are (so far as we know) harmless,—quite unlike the copious bloodletting and salivation treatments of a by-gone age.

At the same time it must be remembered that the use of valueless "remedies," however harmless in themselves, hinders or altogether prevents the search for real and rational ones. The sooner, therefore, attention is drawn to them the better for the patients, even should there be nothing to propose in lieu of those discarded.

Although the absurdity of the lithia water "bull," merely requires to be mentioned to a trained chemist to be at once recognized, it may be as well to give a few details.

In the first place, substitution of lithium for sodium in the animal economy would probably be by no means an unimportant change. Physiologists have found that the substitution of the blood of one animal for that of another is possible in the case of allied species, but in that of animals belonging to different genera the change may be followed by immediate death. In all probability, therefore, it would be a very risky proceeding to convert the albuminate of sodium in human blood into albuminate of lithium, even if it were possible. Fortunately for the patient, however, this is as likely to be successful as the notion regarding the medicinal use of free phosphorus,—viz., "The brain contains free phosphorus, and the more brain-work the more of that element is excreted. Therefore, to restore brain waste, give phosphorus pills." Such a crudity as this would be scouted, even as regards the mineral kingdom,—*e.g.*, in the simple, or comparatively simple, operations of metallurgy.

In the second place, the question of quantity may be considered. As a bottle of lithia water contains about five grains of lithia, it is chemically equivalent to about ten grains of sodium.

The quantity of blood in an adult being about 100,000 grains, and containing about

294 grains of chloride of sodium, equivalent to about 156 grains of sodium, it would evidently require fifteen or sixteen bottles of lithia water to replace the sodium by lithia, supposing that sodium salts were absent from the food.

From the quantity and composition of the urine, however, we know that about 140 grains of common salt, equivalent to about 75 grains of sodium, are excreted every twenty-four hours, derived, of course, from the food. It follows, therefore, that from seven to eight bottles of lithia water would be required every day for the sole purpose of dealing with the sodium salts introduced in the food.

These results are conclusive as to the value of the present practice.

To the chemist, however, the above figures are superfluous. He knows that the tendency is towards the formation of the more insoluble, not of the more soluble, compounds; and that for lithia to be of any service in avoiding decomposition of urates in the joints or bladder, all bases which form compounds with uric acid of less solubility than lithic urate (potassium, sodium, ammonium) must be absent.

If we have a solution containing a phosphate, a magnesium salt, and free ammonium, we know that in a longer or shorter time a precipitate of ammonio-magnesic phosphate will take place, and the only way to prevent it is to insure the absence of one of the constituents of the precipitate. We cannot argue that "phosphate of potassium is more soluble than ammonio-magnesic phosphate, so by adding a salt of potassium to the solution we shall prevent the formation of the very sparingly soluble magnesium compound," and yet that is the assumption with regard to the medicinal use of lithia water.

It is a chemical exemplification of the truth of the old proverb about one man being able to lead a horse to the water, etc. It would be extremely convenient as regards uric acid patients if lithia water could be made to act in this way, but the laws of chemical combination do not admit of it. The medical profession, therefore, must recognize the fact and seek elsewhere for a remedy or palliative for their patients.

An analogous case occurred in the gas world, where gas engineers strove for many years to purify the gas from bisulphide of carbon vapor by means of sulphide of calcium, and at the same time endeavored to make the spent lime inodorous by converting it into carbonate before taking it out of the purifier. Here, again, it would have been very convenient if carbonate of calcium could have been induced to combine with carbon bisulphide, but it is hardly necessary to remark that the attempt was a failure.

Although it is a matter for regret that the science of therapeutics should be in such an elementary stage in the nineteenth century, still, the physician is but in the same predicament as the chemist whose work lies in the vegetable and animal kingdoms. Take, for example, the apparently simple question of water analysis. The intellect of the civilized world for fifty years or more has been unable to devise a process (physical, chemical, microscopical, or biological) which will enable the operator to say with certainty, "This water is wholesome." There are several processes which are capable of detecting bad water, but in many cases this can be done by the senses alone, and so recourse must be had to indirect methods, such as ascertaining the mortality and sickness among the people who use the water, or examining the source as to the probabilities of pollution. Little wonder, then, that medical science is frequently baffled in the attempt to deal with the complex problems of human pathology. Mineral analysis is but child's play compared with the study of morbid actions taking place in closed vessels, suspended in another closed vessel, the walls of all of them being opaque.

A NEW TREATMENT FOR ERYSIPELAS.

GAGE recommends the following treatment for erysipelas in the *Medical Record* of November 3, 1894:

Iodine painted over the healthy skin at the border of the inflammation seldom arrests the progress of the local manifestation, and the old-fashioned method with the nitrate-of-silver pencil is certainly as barren of results. In regard to internal medication, iron has, no doubt, been exhibited more than any other one medicine. Probably no one, however, can state that he has noted any marked diminution in the severity of the disease under the influence of its administration. The same may be said of camphor, benzoate of sodium, and salicylic acid.

In the treatment of erysipelas with a wet carbolic-acid dressing the writer has practically discarded internal medication, treating the disease as a local manifestation, which it certainly is, and only in cases where the patient has been treated in a previous attack by the use of both local application and internal medication has he given some placebo "for the blood." He has used sulphonal for sleeplessness and delirium, in some cases, with marked results. For the cure of the disease

he relies wholly, however, upon the local use of the wet five-per-cent. carbolized dressing. He makes his own dressing from bleached cheese-cloth. This dressing he keeps in his office in a large earthen crock covered with a five-per-cent. solution of carbolic acid. The treatment can, of course, be applied to any case of erysipelas, but we will take for example a case of the facial manifestation of the disease. If the area of inflammation has encroached upon the line of the beard, the face should be shaved, as should the head if the region of the hair be involved. He has found it best, even though the eyes are not yet affected by the disease, to close them and place over each one a fluffed pledget of the wet gauze. If the ears are involved, a small portion of the dressing should be placed back of each one, so that they shall not be pressed against the head by the bandage which is to be applied. Now apply the main dressing, which should envelop the head and face, including all parts which have a tendency to show the blush of the extending disease, being careful to let the dressing extend over the area of redness in all directions. Over the dressing a sheet of rubber tissue or oiled silk should be placed, the edge of the protective lapping well over the edge of the gauze. A bandage is now applied to hold the dressing in place. Care should be taken to so fix the dressing that the mouth and nasal cavities shall be free, although the eyes are to be covered. You have now converted your patient's head into an object somewhat resembling an Armour ham, but he feels better at once, as the gauze has, by mere contact, removed a considerable amount of heat from the diseased area. This dressing should be allowed to remain on for twenty-four hours, when it is to be removed and replaced by a similar one. The marked diminution in the heat and redness over the area covered by the dressing is surprising, even after the first twenty-four-hour period. The dressing is to be reapplied as long as the least suspicion of redness of the skin remains.

It is absolutely essential that all signs of inflammation should disappear before the dressing is removed for good, as you will otherwise be disappointed to notice a return of the disease which you had supposed cured. Better a day too long in a bandage than a repetition of the trouble. Up to reporting this treatment the author has handled eleven cases. The cases have included, besides the facial type of the disease, three cases of traumatic erysipelas, in which, if anything, the treatment was more satisfactory than in the other cases.—*Medical Record*, November 3, 1894.

TREATMENT OF DIFFUSE PURULENT PERITONITIS.

HERHOLD (*Deut. Med. Woch.*, September 27, 1894) relates two cases in which recovery ensued after incision and drainage.

CASE I.—A patient, aged fifty-four, was admitted with a strangulated hernia. An empty hernial sac was found on the right side and a piece of omentum and intestine on the left. After the intestine slipped back into the omentum, discolored and ill-smelling fluid escaped. The condition of the patient did not improve, and six days later the abdomen was opened along the outer edge of the left rectus muscle; three hundred cubic centimetres of stinking pus escaped. The intestines were felt to be glued together. The patient recovered.

CASE II.—A boy, aged eight, was admitted with signs of peritonitis with effusion. Later he became desperately ill. The abdomen was incised and drained, two hundred and fifty cubic centimetres of stinking pus escaping. The finger introduced into the wound felt coils of intestine glued together. Rapid improvement and ultimate recovery ensued.

The cause of the peritonitis was not clear in either case. The author then gives the statistics of published cases of diffuse purulent peritonitis treated by incision. In the Berlin Charité twenty-five such cases have occurred, and of these five recovered, but the hopeless nature of the cases accounts for this small number; in two the peritonitis was due to perforation in enteric fever, in nine to long-continued obstruction, in four to perforating intestinal ulcers, in one to a perforating gastric ulcer, and in nine no cause was known. Purulent peritonitis which is part of a general sepsis is hopeless.—*British Medical Journal*, November 3, 1894.

PERMANGANATE OF POTASSIUM AS AN ANTIDOTE FOR RATTLESNAKE-BITES; A RECENT CASE.

MALONEY records in the *Medical Record* for November 3, 1894, his experience with this method. The case is as follows:

Mr. G. was bitten on the right middle finger by a fair-sized rattlesnake which he was handling at the time. He immediately put the snake back in the cage and applied suction with his mouth to the wound; this was continued for about fifteen minutes, when he used a strong solution of ammonia. At the end of half an hour the finger began to swell. He tied a string on the finger above the bite, but the swelling continued. In two hours it had reached the wrist; he then removed the string

and made an incision through the wound with his penknife. After partaking of a large drink of whiskey he set out to obtain medical aid. Not finding the person he desired, he went to the City Hospital, where the house surgeon made several free incisions on the finger, hand, and forearm, as by that time the swelling had extended as far as the elbow-joint. The wounds were then dressed with iodoform gauze and bandaged.

The free bleeding relieved the pain and some swelling. The after-treatment was dressings, changed every day for four weeks. When all the wounds were healed he had no constitutional symptoms, as the swelling did not go beyond the elbow-joint.

The writer suggested to Mr. G. that he obtain permanganate for use hypodermically in case he was bitten again. This he did, securing a hypodermic syringe and some permanganate of potassium, taking a two-ounce bottle. He also had a rubber bandage which he keeps in the same box with the syringe and solution. These are near the case which contains the rattlers.

An opportunity presented itself on September 28, by which he clearly demonstrated the value of permanganate of potassium as an antidote to rattlesnake-poisoning.

Mr. G. very often exhibits the fangs of a rattlesnake to the visitors to his place. This he does by catching the snake just behind the head with one hand, and by a sort of tongue depressor opens the mouth of the snake with the other. This day the snake might have been a little hungry, and while handling it Mr. G. felt a sharp sting in the joint of the left index finger; he dropped his pet back in the cage and reached for his syringe and solution. An assistant filled the syringe while Mr. G. tied a string round the finger above the wound. He then injected the solution into the finger near the bite. In a few minutes the finger began to swell, and when the pain became severe he used the rubber bandage at the wrist and loosened the string, and then injected another syringeful of the solution. There was no further swelling and very little pain. In two days there was no sign of the bite; he used the finger as usual. He stated that he was more at home now than ever with rattlers.

TREATMENT OF LEUKOPLAKIA.

S. ROSENBERG (*Deut. Med. Woch.*, September 13, 1894) reports the following case: A man, aged forty-two, who had suffered twenty years before from a primary sore on the penis without sequelæ, had for seven years been the subject of leukoplakia of the tongue. Small, painful, shallow ulcers frequently formed on its upper surface, and in healing left bluish, shining scars. The whole dorsum of the tongue was covered with whitish patches and was marked with fissures crossing each other in various directions. Abstinence from smoking had no effect, nor were mouth-washes of resorcin, pencillings with lactic acid, or the application of iodoform or methylene-blue of any effect. Finally, Rosenberg tried pencilling with a twenty-per-cent. solution of iodide of potassium. The effect was "wonderful." The application was followed by an intense burning sensation, which ceased in about half an hour, when the ulcer became painless. Further pencillings brought about healing in a few days. Such control has this application over the process that the patient by daily pencilling of his tongue can keep it entirely free from ulcers. He can smoke and take pungent substances without the slightest inconvenience. The author thinks that the case just related justifies a trial of the method in analogous cases.

LEISTIKOW (*Monatshefte für Prak. Derm.*, Bd. xix., No. 7, October 1, 1894) says that during the last three years he has obtained very good results in numerous cases of leukoplakia from the use of a concentrated solution of resorcin in spirit. In all these cases there were signs of present or past syphilis, but treatment with mercury and iodide of potassium had no effect on the condition. In the case of leukoplakia of the tongue and mouth, the difficulty always has been to find a means of keeping the remedy employed in sufficiently prolonged contact with the mucous membrane to be useful. The author now uses a thick paste, which dries on the part and penetrates deeply into the substance of the mucous membrane. The following is the formula:

℞ Terræ silica, gr. xxiiss;
Resorcin, gr. xlv;
Adipis, ℥i.

By means of small pledgets of cotton-wool twisted loosely around a pointed piece of wood this paste is applied several times a day, particularly after meals and immediately before going to bed. In from eight to fourteen days the opaline patches are seen to have shrunk, and the mucous membrane itself is thin and has a rosy appearance. In this condition, however, the membrane is still very sensitive, so that smoking and the use of pungent condiments must be forbidden, and the mouth must

be freely washed out with a solution of boric acid in water. The hyperæmia of the patches to which resorcin has been applied can be quickly subdued by the application of balsam of Peru. By the application of the latter substance three or four times a day restitutio ad integrum is brought about.—*British Medical Journal*, November 3, 1894.

TREATMENT OF DIPHTHERIA.

WHITE, in the *Medical Record* for November 3, 1894, details some clinical studies made by him on this disease.

The cases of diphtheria included in this investigation were subjected to three different modes of treatment.

In the first series the nasal and throat cavities were thoroughly irrigated every one to three hours with warm salt solution until the pseudo-membrane had disappeared, then from one to three times daily until the entire disappearance of the bacilli. For irrigation, the fountain or Davidson's syringe was used.

In the second series the cases, besides receiving the treatment given in the first series, had their nares and throats thoroughly sprayed every three hours (except during the night) with solutions of peroxide of hydrogen which varied from twenty-five to five per cent. in strength. The special form of peroxide used was that known under the name of pyrozone.

The third series of cases were subjected to the same treatment as the first, except that solutions of bichloride of mercury were substituted for the salt-water solution. The nasal cavities were irrigated every eight hours with a warmed 1 to 4000 solution and the throat every three hours with a 1 to 3000 solution.

Besides this local treatment, nearly all the cases received frequent doses by the mouth of the tincture of the chloride of iron and of alcoholic stimulants.

In using the pyrozone three different strengths were employed,—twenty-five-, twelve-and-a-half-, and five-per-cent. solutions. With the twenty-five-per-cent. solution the average time for disappearance of bacilli after disappearance of membrane was 6.8 days, a somewhat better result than with bichloride or salt solution, but it was very noticeable that the pseudo-membrane treated with the stronger solutions of pyrozone lasted much longer than would be expected from the severity of the disease, and certainly much longer than in those cases where the five-per-cent. solution of pyrozone or the salt or bichloride solution was employed. Out of sixteen cases treated with the twenty-five- and twelve-and-a-half-per-cent. solutions of pyrozone, ten had membrane from ten to sixteen days, while in another quite bad case traces of the pseudo-membrane persisted for twenty-three days.

The average time from the first appearance of diphtheritic membrane to the disappearance of bacilli in the twenty-five-per-cent. cases was 17.75 days, this not being quite as good a record as that made by the bichloride solution and about the same as that made by the water irrigation. As all the pyrozone cases received, as mentioned before, thorough washing of the throat and nose before and after treatment with the spray, the results, as shown in the tables, would indicate that the addition of spraying strong solutions of peroxide to the treatment with plain water irrigation had no good results. On the contrary, it would seem from the long continuance of the diphtheritic membrane in those cases treated with the twenty-five- and twelve-and-a-half-per-cent. solutions that they acted as an irritant to the already inflamed mucous membrane.

The five-per-cent. solution caused no noticeable irritation. The pseudo-membrane disappeared in the usual time, and it would certainly appear to be the best strength (if any) to use for this purpose.

Among the twenty cases on the bichloride treatment, one, a boy four years old, developed mercurial stomatitis in quite a severe form, and another showed symptoms of intestinal irritation; both of them were undoubtedly caused by swallowing bichloride solution during irrigation, as they had not been given internally mercury in any form. Both soon recovered after the cessation of the bichloride irrigation.

Laryngeal cases have not been included in the list, as the treatment tried in these cases could have no possible effect upon membrane or bacilli in the larynx. In six cases in which these three tests were tried, it apparently had no effect whatever, the bacilli being found in the larynx from thirty to forty days after admission to the hospital.

Since the tabulation of the cases in this report was made the writer has had two cases in which the Klebs-Loeffler bacilli persisted for twenty-nine and forty-eight days respectively after disappearance of membrane. These cases received the bichloride irrigation treatment, as described above, until all signs of the bacilli had disappeared. This would make the average number of days for the persistence of the bacilli after disappearance of membrane and the entire duration of the disease about the

same in the bichloride cases as in those where no antiseptic was used.

The results obtained in the special series of forty cases treated with plain or salt-water irrigation are similar to those obtained in over six hundred other cases treated in a like manner; while frequent and careful experiments with nearly all the well-established antiseptics have given practically the same results accomplished by the pyrozone and bichloride of mercury in this series of experiments.

The conclusions derived from this series of cases, together with investigation and observation on a much larger number of cases, lead us to believe:

1. That frequent washing of the air-passages attacked by diphtheria lessens the duration and amount of diphtheritic membrane.

2. The addition of antiseptics, in sufficient strength to be germicidal, to the irrigating fluid is irritating to the mucous membrane, thereby causing extension and persistence of false membrane rather than the effect desired.

3. The addition of antiseptics to the irrigating fluid is liable to cause systemic poisoning and disagreeable complications from the swallowing and absorption of some of the fluid used,—*e.g.*, the two bichloride cases cited above.

4. Spraying the throat (also the pernicious treatment of swabbing), whatever solution is used, can have no good effect, as the parts reached by the spray must necessarily be very limited, excepting, possibly, in the hands of an expert. Furthermore, the spray cannot be used with young children, as any one can testify who has tried it. This is especially true of some solutions where it is necessary to use a glass syringe.

5. Frequent cleansing of the throat and nasal cavities with a bland solution, such as plain warm water or normal salt solution, is easier of application, is more agreeable to the patient, and does all that any antiseptic solution can accomplish, either upon duration of the membrane or the period of isolation.

DIURETIN.

Panowski (*Zeitschr. f. Klin. Med.*, vol. xxiv., 3 and 4, 1894) has investigated the action of diuretin with the view of determining whether the renal activity was intensified or whether the vaso-motor system became affected. Fifty cases were submitted to most careful investigation, with the following results: A tonic action is exerted on the cardiac muscle, the area of cardiac dulness diminishing even before any improvement of the œdema has become noticeable. In this respect it resembles caffeine, but cannot compete with digitalis. In the vessels a considerable increase of pressure is noticeable, and is regarded by the author as attributable to a stimulation of the nerve-centre. The diuresis is very marked, but, in the author's opinion, is the result of the increased pressure in the vaso-motor system. He recommends it as a diuretic in valvular lesions after digitalis has failed, when the effects of diuretin may be surprising. Of greater importance is its action in affections of the cardiac muscle, where he has seen remarkable results after digitalis, camphor, and caffeine had given no relief. In renal affections the good effects were not so marked, but diuretin is held by the author to be preferable to digitalis when there is slowness of the pulse as a forerunner of uræmia. In the other œdematous conditions it is not to be recommended. The drug is best given in powders of 15 grains four to six times daily, or can be given in solution, when the effects will be first noticeable between the second and sixth day.—*British Medical Journal*, November 3, 1894.

CONSTIPATION IN CASES OF TEA-POISONING.

Wood writes on this topic in the *Brooklyn Medical Journal* for November, 1894. He says that the plan which was found to give the best results was to commence by interdicting the use of tea, coffee, or any form of liquor. This must be insisted upon in the strongest manner, else the patients, like all inebriates, will be found indulging their annoying importunities for tea.

The alimentary canal should be thoroughly cleared out by giving a rather large dose of calomel and jalap (8 grains of each) at night, to be followed in the morning by Rochelle or Epsom salts (1½ ounces). This will assure an almost completely empty intestine and the absence of fermenting material, which, in a large majority of cases, produces a true auto-intoxication. The patient should be kept on hot milk for several days, the only medication being 4 grains of caffeine and 8 grains of sodium bromide every four hours. This quiets the irritable nervous condition, and the limited food gives nature an opportunity to regain lost tone.

The use of cascara sagrada is commenced at this time, the dose being from 15 to 40 minims every four hours. From the third to the tenth day the patient's diet is increased to the proper

amount as demanded by the work performed, care being taken to eliminate such stimulating and non-nutritious articles as the starch and sugars, so far as possible.

The dose of cascara sagrada mentioned above may be increased and the time for giving it lengthened until the patient's bowels will move freely at least once a day by the employment of from ½ to 1 drachm at night.

In a number of cases, when this regularity has been observed, the following prescription will be found of great use:

℞ Inspissated ox bile, pure, ℈ii;
Sulphate of quinine, ℈i;
Sulphate of strychnine, gr. i;
Extract of cascara sagrada, ℈i;
Extract of euonymus, ℈ii;
Extract of gentian, q. s.

Divide into forty capsules; 2 are used morning and night.

The inspissated fel bovis prevents to a large degree intestinal decomposition, accelerates peristaltic action, improves the intestinal digestion, and increases and hastens absorption. In being taken up by the liver it furnishes a fresh impulse and available material for the formation of new bile. The strychnine serves as a bitter tonic and a stimulant to the spinal centres, and the nerves of the splenic arcade and, in turn, the glands which they supply resume their former activity. The euonymus is a cholagogue cathartic and stimulates the liver to secrete a better quality of bile. Enough of the cascara is used with the euonymus to assure a good passage from the bowels daily.

In a number of cases Fowler's solution is given so soon as the bowels are moving daily, and often with excellent results. The preparation of cascara which is given the preference over all others is the aromatic fluid extract or elixir. This palatable method of giving the drug should be resorted to whenever it can possibly be procured, and many patients who are in a neurasthenic and hysterical condition and have a horror of all medicines will offer little objection to this preparation.

The nerves of the alimentary canal during tea intoxication are in a torpid condition from over-excitation, and the secretions of the glands have been very much reduced by the large amount of tannic acid in the tea infusion. No drug has yet been found which will so well restore the lost tone of the debilitated gut and increase the secretion and peristaltic action as cascara. The action of the drug on the bowels is not sudden; the more sudden acting cathartics, in the author's hands at least, have proved harmful. What is clearly indicated is a tonic laxative which will at the same time increase the action and secretion of the gastric, intestinal, and biliary organs.

In cases of constipation of short duration the capsule above given is not used, but dependence is entirely on the cascara. It has been found eminently satisfactory. In those cases where the intoxication has extended over a number of years other medicinal agents must be added which will restore the lost bodily tone and correct functional perversion.

Treatment should not be stopped as soon as the patients feel better; in many cases it must be continued for several weeks. After the digestive troubles have been overcome and the system shows a tendency to establish an equipoise of health, a tonic pill is used for a considerable time. The constituents may be arranged to suit the advancement made. It is as follows:

℞ Sulphate of strychnine, gr. i;
Hydrochlorate of caffeine,
Extract of damiana, of each, ℥i;
Hydrochlorate of cocaine, ℈i;
Extract of taraxacum, ℥ss.

Divide in twenty pills, of which 1 should be given twice daily.

This excellent formula was arranged and much used by Professor W. H. Porter, of New York, with the most gratifying results as a stimulating restorative in all complaints which had associated with them loss of bodily tone. The caffeine and damiana are nutritive tonics of no mean ability to the cerebro-spinal centres and the motor nerves which supply the splenic arcade. The cocaine is only added in those cases where the hyperæsthesia of the solar plexus produces the sinking sensation in the pit of the stomach which is much complained of. By this procedure permanent relief can be given to the truly deplorable condition of by no means a rare class of patients.

SHEEP'S THYROID IN GRAVES'S DISEASE.

J. Voisin (*Sem. Méd.*, October 24, 1894) recently communicated to the Société Médicale des Hôpitaux the case of a woman, aged thirty-two, suffering from Graves's disease, to whom he prescribed 6 to 8 grammes of sheep's thyroid, to be taken every day in two doses before meals. After a fortnight of this treatment very marked improvement was observed; the heart-beats had become regular, and had fallen from 150 to 100 per minute; the œdema of the lower

limbs had disappeared; the enlargement of the thyroid and the exophthalmos had also appreciably diminished. The patient continued to take daily some fragments of thyroid, taking care to suspend the treatment for ten days every three weeks. The improvement had been maintained, and at the date of report the woman had no symptoms of the disease beyond trifling swelling of the neck and slight exophthalmos. Dreyfus-Brisac said that the thyroid treatment should not be employed in all persons suffering from Graves's disease. In all the cases which had come under his notice that method of treatment had aggravated the symptoms. Beclere's experience had been similar.—*British Medical Journal*, November 17, 1894.

THE LOCAL TREATMENT OF ERYSIPELAS WITH ANTISEPTICS.

L'Union Médicale for September 29 publishes an article on this subject, in which the author remarks that since recent researches have shown that erysipelas depends upon pyogenic streptococci a large number of antiseptics have been tried locally. One of the most universally used is corrosive sublimate, of which Talamon used a one-per-cent. solution in ether in a small spray apparatus in the following manner: Simply sprinkle the centre of the patch, but spray plentifully and for a longer time over the periphery, and particularly over the marginal prominence; at the same time a space of one or two centimetres on the healthy skin should be sprayed in order to arrest the spread of the disease. This should be continued for a longer time on the back of the neck, on the back, on the body, and on the limbs than on the face. Before beginning this treatment the patient should be warned that the spraying will produce a painful, smarting sensation, although it is no more painful than the tension of the skin caused by the erysipelatous infiltration; also that the face becomes bloated and that blisters and crusts will form, consequences, however, that may be brought out and often are occasioned by the disease itself. The crust should not be touched with the fingers; it should become detached and fall under the application of compresses saturated with boric-acid solution, which are to be kept on the diseased parts during the intervals between the spraying. According to Talamon, if this treatment is employed from the onset of the disease, it may cut it short in twenty-four hours, and even in grave cases the virulence of the germ becomes attenuated. Spraying with corrosive sublimate may cause the appearance of a pigmentary mask; it may also develop an intense and rebellious dermatitis.

Robin employed Van Swieten's liquor combined with tartaric acid, and sprayed over a space of thirty centimetres for half an hour four times a day. This treatment does not produce any lesions of the skin, and, instead of giving rise to pain, it acts as a sedative.

Labanewski applied compresses saturated in a hot solution of Van Swieten's liquor, and renewed them as often as possible.

Petrini, after using calomel, applied locally a solution of 2 grains of corrosive sublimate in 2 ounces of flexible collodion. The affected parts were painted with this twice a day for three or four days, and a thick layer of the solution was applied to the edge of the patch and somewhat beyond it. Pills containing quinine sulphate and iodoform were given. This treatment, says the writer, is sufficiently aseptic to prevent all danger of contagion. Collodion has been employed by many authors as an agent of compression, and if it is used for this purpose very thick layers must be applied to the edge of the patch. Diachylon also has been used on the edge of the erysipelatous region.

Juhel-Renoy obtained good results with a mixture of traumaticin and ichthyol, which should be applied with a brush around the patch for a distance of about one to two centimetres; this preparation causes a slight smarting sensation.

Gluck employed ichthyol in the following manner: First, carefully wash the affected region; then make a number of incisions in it and in a small circle of the surrounding skin; these incisions may be partly superficial and partly deep,—that is, going as far as the subcutaneous tissue. The scarified surface is then washed with an antiseptic solution, energetically manipulated, dried, and rubbed with a sixty-per-cent. ointment of ichthyol. Finally, a layer of this ointment is applied and covered with cotton. These frictions with ichthyol should be continued for several days after the fever has disappeared. Ichthyol exercises a more powerfully destructive action on streptococci than carbolic acid.

Ochner combined pure alcohol with ichthyol, and painted the diseased parts three or four times a day; during the night the ichthyol was used in the form of an ointment. The local process was immediately arrested, and the temperature became normal in twenty-four hours.

Vaskressepsky used compresses of diachylon above and below the diseased parts, together with the following ointment: Ichthyol, from 60 to 120 grains; lard, 450 grains.

Hueter advocated subcutaneous injections of carbolic acid, which should be made in the healthy skin at a distance of from one to two centimetres from the erysipelatous swelling, and the diseased parts surrounded with injections from three to six centimetres apart. Over this a sheet of cotton is to be placed. From 30 to 45 centimetres may be injected at a time. The fever falls and the redness disappears in from twelve to twenty-four hours. The injections are painful and may be followed by small abscesses, and symptoms of intoxication may also occur.

Hayem employed a solution of equal parts of carbolic acid and alcohol without causing any pain, but if the carbolic acid is in excess it produces persistent cicatrices.

Trapeznik prescribed a mixture of 60 grains of carbolic acid and 3 ounces of oil of turpentine.

Rathe employed a mixture containing carbolic acid, tincture of iodine, alcohol, and glycerin.

Wilde used injections of sodium sulphocarbolate, and Petersen used salicylic acid in the same way.

Le Gendre employed subcutaneous injections of boric acid in a one-per-cent. or in a 1 in 50 solution. Two circles of injections are made, the first from three to four centimetres from the erysipelatous marginal swelling, and the second three centimetres beyond the first.

Riedel made two series of incisions on the erysipelatous swelling half a centimetre apart and crossing at right angles. The point of intersection should correspond to the limit of the patch. Afterwards it is covered with compresses saturated with a solution of corrosive sublimate, which are renewed three times a day. Recovery is very rapid, but, unfortunately, it is often necessary to use chloroform, and, furthermore, the treatment sometimes leaves visible cicatrices.

Other writers, says the author, may be added to this list, but it is better to make a choice, and he thinks that the preference should be given to the employment of the spray with corrosive sublimate, cautiously practised according to Robin's method. At the same time emollient fomentations and inunctions with vaseline to which boric acid has been added may be employed, as they rapidly quiet the pains.—*New York Medical Journal*, November 3, 1894.

EXTERNAL APPLICATION OF GUAIACOL IN FEVER.

S. T. Bartoszewicz, of Professor Lomikovsky's clinic, in Kharkov (*Yujno-Russkaia Meditzinskaia Gazeta*, Nos. 23 and 24, 1894) has used guaiacol externally in eleven febrile cases (four phthisis, two pleurisy, two typhoid, one pneumonia, one peliosis rheumatica, one intermittent), the number of experiments amounting to sixty-five. At first he rubbed the drug with soft flannel into this or that cutaneous area, about five square decimetres in extent. In spite of his using only gentle pressure, the application always gave rise to local dermatitis, with superficial ulcers and scurfing. This complication led him to abandon the frictions in favor of a novel method devised by himself. A piece of linen three square decimetres in size, soaked with 25 or 30 drops of pure guaiacol, was applied to the forehead, back of the neck, or upper part of the chest, then covered with wax-paper, fixed by a bandage, and left *in situ* for one or two hours. It was found that such compresses had exactly the same antipyretic effects as the inunction, while they caused no cutaneous irritation beyond slight redness. The principal results of the clinical research may be summarized as follows:

1. Of sixty-five cases, only in five the results were *nil*, and only in nine the temperature subsequently rose to the primary height. The maximum effects (2.5° to 3° C.) occurred in phthisis, the depression in a majority of cases varying between 1.2° and 1.5° C.

2. The drug does not give rise to collapse, even in phthisical subjects with large cavities. In these patients, however, the application is almost invariably followed, in from two to four hours, by perspiration and rigors.

3. Compresses are the best mode of application.

4. Chemically pure crystalline guaiacol should be preferred to the ordinary fluid preparation, since it allows a better dosage and does not irritate the skin, even when rubbed in.—*British Medical Journal*, November 17, 1894.

CHLOROFORM OR ETHER?

Under this caption, Professor J. Mikulicz, of Breslau, discusses in a very impartial spirit the much-disputed question as to the relative danger as anæsthetics of chloroform and ether. He begins by referring to a paper by Gurlt, read before the German Surgical Society (*Verh. der Deutsch. Ges. Chir.*, 1893, ii. S. 8). In this paper, Gurlt gave statistics in 1893, showing that in 133,729 chloroformizations there oc-

curred 46 deaths, or 1 to 2907 anæsthesias; whereas in 14,646 etherizations there occurred only 1 death. Gurlt's warning that ether was much the safer anæsthetic naturally led to a much more extended use of it, the statistics in the last report (*ibid.*, 1894, ii. S. 11) showing 1 death in 13,160 etherizations, as against 1 in 2647 chloroformizations. The statistics seemed so favorable to ether that Mikulicz also began to employ it; but his results, especially *after* etherization, contraindicated the lauded harmlessness of ether, and he has been induced to return to chloroform.

The ether employed was Merck's; it was administered by means of Juillard's mask, and the directions followed were those of Garré. Mikulicz was especially careful in the choice of cases. It was not given to any suffering with serious affection of the air-passages, nor to small children, old, weak persons, nor to those with weak hearts or highly anæmic. After referring to the fact that etherization is disagreeable, he remarks that this is insignificant when the life of the patient is in danger. Mikulicz then reports his unfortunate experiences with ether.

The first group of cases is one in which asphyxia occurred during etherization, and includes three cases. The pulse and respiration ceased, but the patients recovered.

The second group includes two cases in which collapse occurred after etherization. After artificial respiration and injections of camphor, the patients reacted.

The third group includes four cases of acute bronchitis; all recovered.

The fourth group includes two cases of pulmonary œdema and pneumonia; one of these proved fatal. The operation had been done for stenosis of the œsophagus; etherization lasted sixty-five minutes, 175 cubic centimetres of ether being consumed. Death occurred on the twelfth day after operation. No autopsy.

Mikulicz insists that these cases of bad effects from ether show that it must be given with as much care as chloroform and by a skilled physician.

Whether the dangers of late collapse and ether pneumonia are as great as he fears cannot be answered from existing statistics, as deaths occurring late are either not mentioned or only mentioned incidentally. Poppert, however, reports a death occurring two hours after the end of etherization, with symptoms of acute œdema of the lungs. Poppert also collects from the literature seven cases of œdema of the lungs which proved fatal either a short time after etherization or in several hours,—in one case seventeen, and in another thirty-two hours. The same author finds in Gurlt's last report eight cases, as follows: 1, a case of pulmonary œdema (Trendelenburg); 2, two cases of late collapse (Rehn, after thirty hours; Trendelenburg, after two hours); 3, five cases of pneumonia (Bessel-Hagen, one; Czerny and Riedel, each two cases). In addition to these eight cases, a case of late collapse occurred in the Bonn clinic, and nearly ended fatally.

It follows, therefore, says Mikulicz, (1) that ether has dangers which have not been considered in the statistics up to the present time, and (2) that the lessened danger of etherization, as compared with chloroformization, has not been proved.

DEATHS UNDER ANÆSTHETICS.

Dr. C. F. Marshall (late Anæsthetist to the Hospital for Sick Children, Great Ormond Street) writes, There appears of late to have been an increase rather than a decrease in the number of deaths under chloroform, cases having from time to time been reported in the *British Medical Journal*, and comments made thereon. The question, however, as to whether it is ever necessary, and, if not, whether it is justifiable, to give chloroform, does not appear to have had due consideration. I maintain that it is never necessary to use pure chloroform as an anæsthetic, and that when used it should be mixed with ether. The most satisfactory combination, so far as my experience goes, is a mixture of equal parts of chloroform and ether, which can be given on a piece of folded lint with the same ease as chloroform. The advantages of this mixture are the following:

1. The ether acts as a stimulus, counteracting the depressing effects of the chloroform on the heart. (That chloroform has a depressing effect on the heart is a clinical fact, whatever the results of the Hyderabad experiments may attempt to prove.)

2. During the commencement of the administration and during the struggling stage the patient is chiefly breathing ether, which evaporates more quickly, and so the initial stage is tided over.

3. During struggling, for the above reason, the anæsthetic can be pushed with much more safety than can chloroform alone.

4. For the same reason there is less shock in those too frequent cases where the surgeon commences to operate before the patient is ready.

The only disadvantages are (1) that about

two or three times as much anæsthetic is used; (2) sometimes rather profuse salivation is excited. These are, however, trivial points compared with the greater safety of the mixture. I am well aware that mixtures of chloroform and ether in various proportions have been used for some considerable time. The point I wish to urge is, that there is never any occasion to use chloroform, except in the form of a mixture with ether; and, therefore, considering the number of fatalities from chloroform, that its employment by itself as an anæsthetic is unjustifiable and should be abolished.—*British Medical Journal*, November 17, 1894.

POISONING BY CHLORATE OF POTASSIUM.

In the *Journal of the American Medical Association* for December 8, 1894, McSHAIN reports the case of a girl of eleven years who, twenty-four hours previously, had, while employing a gargle of chlorate of potassium, swallowed a considerable quantity of the solution, which, with some tablets of chlorate of potassium which she had taken, represented about two hundred grains of the drug. The condition of the patient was that of marked cyanosis and temperature of 102° to 103° F.; scanty urine, which was exceedingly dark in color, and which, finally, was not secreted in larger quantities than half an ounce in twenty-four hours. Later on in the case the urine became somewhat more free, but contained large quantities of albumin, while jaundice and hepatic tenderness were developed. McShain quotes two cases,—one reported by Scherer, in which a grown man presented grave symptoms of poisoning after taking two cents' worth of chlorate of potassium; and another case of Dr. Hays, in which a young woman swallowed an unknown quantity of chlorate of potassium after the purchase of ten cents' worth of this article. In both of these cases symptoms were like those of the case reported by McShain, excepting that in these cases recovery took place, while in that of McShain death suddenly occurred on the sixth day after the poison had been ingested.

THE TREATMENT OF SCROFULOSIS WITH CREOSOTE.

DR. ALEXANDER EECK (*St. Petersburger Med. Woch.*, No. 37, 1894) says he has used creosote as the only remedy against scrofulosis for a number of years, and has obtained very favorable results from it. He refers to Sommerbrodt's recommendation of the remedy in this disease, based upon the belief that tuberculosis and scrofulosis are identical. Eeck does not believe they are, but holds scrofulosis to be a constitutional anomaly, a general chronic disease which finds its expression in a disturbance of the nutrition of the whole organism.

Eeck has employed creosote in scrofulous children of all ages. In one respect he varies from Sommerbrodt's directions,—he increases the dose gradually instead of rapidly, as he finds that patients bear it better when given in this way. He is guided by the following principles: 1, as large a dose as possible; 2, gradually increasing doses; 3, long-continued use; 4, administration of the creosote a quarter-hour after the three principal meals; 5, administration in milk. Children from one to seven years of age receive creosote with tincture of gentian, and, according to age, one part of creosote to five, four, three, two, or one part tincture of gentian. Children seven years old receive pure creosote. The maximum dose reached in three weeks is continued for two to four months, according to the case. The initial dose is always 1 drop, whether of the mixture with gentian or the pure creosote. After every fourth day the medicine is increased one drop. It is very well borne, and some children become very fond of it. Increase in appetite is very noteworthy. Eeck declares that he has seen swollen glands the size of a walnut subside within a month. Chronic blepharitis has been cured. Freckles lessen in intensity of coloring and extent of distribution. Acne and furunculosis occurring at puberty, and obstinate eczema, were favorably influenced or cured. So, also, severe scrofulous diseases of the bones, with surgical aid, recovered. Eeck denies that creosote injuriously affects the teeth.

INTUBATION OF THE LARYNX.

The writer calls attention to Ermold's lamp for the sublimation of calomel in the treatment of laryngeal diphtheria. This lamp was constructed for this special purpose, and presents many advantages. The metallic chimney, the long funnel for the wick, the asbestos packing, and the shape of the lamp prevent accidents from fire. The lamp is partly filled with alcohol, the wick lighted, and the calomel (from 20 to 40 grammes) placed in the cup-shaped depression at the top of the chimney. A tent is built over the child by spreading an umbrella, over which a sheet is placed, or slats of wood can be placed in each corner of the crib, over which a sheet can be arranged. The lamp

is then placed under the tent on a book or board, or, better still, in a small pail or other deep kitchen utensil, or by means of the wire loop the lamp may be hung from a nail driven into the head of the bed or crib. The calomel is placed in its receptacle and the lamp lighted. The tent is quickly filled with the fumes, which are inhaled. The precautions to be exercised in using calomel sublimations are thus briefly stated by Dr. Dillon Brown, of New York:

1. The nurses and attendants should be warned against inhaling the fumes.

2. The child's skin should be covered so that the full effect of the fumes may be confined as far as possible to the local deposits on the mucous membrane.

3. Before each sublimation the child should be given a small dose of whiskey.

4. After each sublimation the mouth should be cleansed with a mild solution of chlorate of potassium.

5. If the prostration and anæmia seem to be greater than the local manifestations would account for, the amount and frequency of the calomel should be diminished and the stimulants increased.

6. If the nasal cavities are not invaded they should be plugged with cotton.

7. It is important to use pure calomel, free from all irritating properties. The sublimation of calomel in the treatment of diphtheria, known as the Corbin or Brooklyn method, has attained a high reputation in Brooklyn and New York. The treatment is employed both before and after tracheotomy or intubation, and it is claimed that many operations are obviated by its use. From 20 to 40 grains of calomel are sublimated every one, two, or three hours, according to the age of the child and the urgency of the case. Personally, the author has not had sufficient experience to justify an opinion; but, judging from the statistics of others, it is advisable that this method should be tried in all cases.

TREATMENT OF PNEUMONIA IN INFANTS AND YOUNG CHILDREN.

Infants should not be allowed to lie in one position; they should be turned from side to side, and frequently taken up and laid upon the face, across the nurse's lap, or over her shoulder, to prevent as far as possible hypostatic congestion, and to facilitate the expulsion of the mucus by cough.

The matter of feeding needs careful attention. It is a mistake to allow the child to take milk every time that it is thirsty, even though diluted; such frequent feeding almost invariably leads, sooner or later, to indigestion and vomiting. Less food than in health can be digested, and less should be given, usually in a more dilute form, never at intervals shorter than two hours, no matter how young the infant. The thirst may be allayed by water, which should be given freely and at short intervals, preferably the mineral waters, when these can be obtained.

The main point to insist upon would be against the too common practice of overfeeding during high temperature when there is great thirst.

Alcoholic Stimulants.—In most cases of lobar pneumonia alcoholic stimulants are not called for. In broncho-pneumonia they are nearly always required, and in many cases from the outset. Alcohol should be given, not because the patient has pneumonia, but because his pulse is weak, his vital forces feeble, and food assimilation very imperfect. Age is no contraindication. The prejudice against the use of alcohol in very young infants is without foundation. In prescribing stimulants, it is better to decide upon the amount to be given during the twenty-four hours, and allow the nurse to get the quantity in as best she may, sometimes at intervals of from fifteen to thirty minutes, if the child is restless and thirsty, but when he is quiet or sleeping the interval may be longer. Alcoholic stimulants should always be well diluted, spirits with six or eight times the amount of water. Brandy or whiskey is to be preferred, although, if the child takes other forms of alcohol better, Tokay wine, sherry, or champagne may be used. Book doses must be disregarded, and stimulants given fearlessly, according to the child's symptoms, and until the desired effect is produced. 5 drops of brandy every two or three hours is useless. For a child two years old, where alcohol is indicated, ½ ounce of brandy, or the equivalent, ½ drachm every three hours, is valuable. This may be increased, according to circumstances, up to 3 ounces a day, and in very bad cases, for a short time, at the rate of 6 ounces a day to a child of three or four years. Stimulants are usually required in greater quantities at night than by day, and often more just after the critical drop of the temperature than at any other time of the disease.

Rectal feeding and rectal stimulation are not to be relied upon in infants. It is very much better, when the child refuses food or stimulants, to feed him forcibly by means of the stomach-tube.

Antipyretics.—Great discrimination is to be

exercised in the application of antipyretic methods to the treatment of pneumonia. It is probable that drugs of this class are used far too frequently and in too large doses for the good of the patients. In considering the temperature in the pneumonia of children, it must be remembered that it runs usually much higher than in adults.

A temperature ranging between 102° and 105.5° F. may be considered as normal to the disease. Again, a steadily high temperature is exceptional. As a rule, it is of the remittent type, and if a very high point is touched it can be expected to fall spontaneously in a few hours. Children show less disturbance from high temperature than adults. Finally, we must remember the cause that is the source of danger.

When does the temperature demand interference? Our guide should be not only the degree of fever which the thermometer records, but the discomfort and the disturbance to the patient which accompanies this,—the restlessness, delirium, and prostration. No temperature can be fixed upon as one always demanding reduction; not 105° F. usually, and not even 106° F. always. Only recently he observed a patient eleven months old whose temperature touched 107° F., but it was borne with so little disturbance that but for the thermometer it would not have been suspected. This excessive fever lasted but for a few hours; it was not interfered with, and the patient made an excellent recovery. It is only by the frequent use of the thermometer that one can gain any idea of the wide fluctuations of temperature in this class of patients; so it often happens that the physician, taking the temperature on his daily visits, and finding that the thermometer registers 106° F., is greatly alarmed, since text-books have taught him that such a temperature in pneumonia is well-nigh always fatal.

Our use of antipyretics, then, should be limited to cases in which the temperature remains steadily for a day or two at a very high point, and then only when accompanied by signs indicating that the patient is suffering from hyperpyrexia.

If reduction of the temperature is demanded, we should employ those means which will reduce it with most certainty and greatest safety. The writer has used cold quite extensively, and finds it preferable to other means commonly used, the most convenient method being the cold pack, the child being undressed and enveloped in a wet blanket or towel, on the outside of which a large dry blanket is pinned. Continuous reduction is effected by rubbing the patient with ice outside the wet towel, at intervals of from ten to fifteen minutes.

Quinine can scarcely be considered an antipyretic in pneumonia, excepting in cases in which there is a malarial complication; under other circumstances it is valueless and, as commonly given, even injurious, because it disturbs the stomach.

Antipyrin, phenacetin, and antifebrin all reduce the temperature at the expense of a certain amount of cardiac energy, and for this reason they are dangerous in large doses and in small doses often useless.

There are certain cases of very high temperature, accompanied by feeble heart action, general cyanosis, and clammy skin, in which all the above measures are absolutely contraindicated. Here hot mustard baths or the mustard pack sometimes relieve the great internal congestion and in this way lower the temperature; but in most cases these are symptoms indicating death within twenty-four hours.

Of the heart stimulants other than alcohol, the only one which can be depended upon is strychnine. This may be given advantageously in every case in which there is very great prostration and very weak pulse. The usual dose for a child of one year has been $\frac{1}{300}$ grain every two hours; for a short period double the quantity may be given. Strychnine stimulates not only the heart, but the respiration; its great value in pneumonia is not sufficiently appreciated. In cases showing a tendency to acute heart-failure, strychnine may be used hypodermically. Carbonate of ammonium he seldom uses, on account of its tendency to upset the stomach. In a few cases nitro-glycerin, in doses of $\frac{1}{100}$ grain to an infant, has seemed to be useful. The symptoms indicating its use are weak pulse and pale face. Digitalis and strophanthus do not appear to act so favorably in children as in adults. The use of inhalations from the croup-kettle, steam-atomizer, or, best of all, from a vaporizer, such as the one made by Whitall & Tatum, is of very great service in broncho-pneumonia. In ordinary cases the inhalations may be given for ten or fifteen minutes every two hours, the patient being enveloped in a tent. In very severe cases, where there is great dyspnœa and a constant, dry, teasing cough, the inhalations may be given every hour; they are much more valuable than the use of expectorants by the stomach.

All depressing measures are absolutely contraindicated in pneumonia of children under three years. Blisters are barbarous and ineffectual, and, fortunately, have become a thing of the past. The cardiac depressants are un-

called for, their beneficial effects having been greatly exaggerated, and in broncho-pneumonia they only do harm.—HOLT, in *New York Polyclinic* for September 15, 1894.

THE TREATMENT OF DIPHTHERIA WITH ANTITOXIN.

CAMPBELL WHITE writes of his experience in treating diphtheria with antitoxin in the *Medical Record* of November 17, 1894.

The method of obtaining this serum, as invented by Behring and modified by others, we will consider as briefly as possible.

First, a pure culture of diphtheria bacilli must be obtained. It has been found that the more virulent the bacilli, at least after some immunity has been established, the better the results which will follow. Aronson claims that the strength and efficacy of his antitoxin depends chiefly upon this point, and describes an elaborate method by which the virulence of the bacillus can be made five thousand two hundred times stronger than fresh cultures from the most malignant cases. The extremely poisonous culture having been prepared and its strength having been accurately determined, it is injected into the animal which is to furnish the serum, beginning with very small doses, which are gradually increased until the most powerful poison can be resisted by the animal. It requires many months to obtain such an immunity, and the constant liability to the loss of animals from an overdose of the toxin is very great. Animals are selected which have some susceptibility, but of course must not too readily succumb to the poison. The guinea-pig, dog, goat, sheep, cow, and horse have all been used. The horse, being less susceptible and furnishing more antitoxin, is used by Aronson, Roux and Yersin, and more recently by Behring. When it has developed a high degree of immunity the animal is ready to furnish antitoxin. The blood is obtained from the larger veins in the body, the animal first having been put under the influence of morphine or of an anæsthetic. The serum is separated from the blood, and in this serum is contained the antitoxin. It may be mentioned that efforts have been made with some success to still further isolate this antitoxin property or to obtain it in a more concentrated form.

Of course the serum coming from different animals, or from the same animal at different times, necessarily varies in strength, and, to be used therapeutically, some idea of its antitoxin power must be obtained. Ehrlich describes a method employed by Behring for ascertaining (relatively) the amount of antitoxin in the blood-serum. This same method, with perhaps some slight modifications, is used by all others. He first determines the strength of his test-poison,—*i.e.*, how much of this poison is required to kill a guinea-pig of a given weight in thirty-six to forty-eight hours. He then takes of the test-poison ten times the necessary dose to kill the animal and puts this amount in each one of several test-tubes, together with different amounts of the serum to be tested. Salt water is added in sufficient quantities to make all of the same bulk. The contents of these tubes are injected into as many animals. The reaction following the different injections determines the power of the solution tested,—*i.e.*, the quantity of blood-serum necessary to neutralize the poison (save the animal) varies according to the degree of antitoxin it contains. The strength of the solution is expressed by giving the amount of serum required to save an animal of a given weight inoculated with a fixed poison,—*e.g.*, if it requires .001 cubic centimetre of the serum to neutralize sufficient poison to kill an animal weighing three hundred grammes, the strength of the serum is as 1000 cubic centimetres is to 300 grammes, or 1 part of antitoxin to 300,000 parts of body-weight. This can be expressed by simply saying that the serum is a 1 to 300,000 antitoxin solution. With the addition of a small amount of trikresol to preserve it against decomposition, the serum is ready for therapeutic purposes.

In appearance the solution of Behring and the "immunization solution" of Aronson are alike; they look like diluted blood-serum. But the strong solution of Aronson has the appearance and consistency of dirty milk.

The proper treatment of diphtheria undoubtedly lowers the mortality, and without proper treatment and attention we believe every case of diphtheria affecting the nose and throat and larynx would die. The mortality of all cases treated at the hospital during the past two years has been between twenty-eight and twenty-nine per cent., and the treatment pursued in these cases we cannot but believe has had more than a little influence in maintaining so low a percentage of deaths. The essentials of the treatment pursued in these cases are as follows: 1. Absolute rest in bed in recumbent position; 2, fluid diet; 3, the room kept at an even and rather high temperature (75° to 80° F.); 4, thorough, frequent, and complete washing of the nasal and throat cavities with a normal salt solution; 5, tincture of the chloride of iron in large doses; 6, stimulation and catharsis as indicated. In addition to this treatment the

author has depended almost entirely in the laryngeal cases upon calomel sublimations and moist heat applied externally, with operative interference when necessary.

That this treatment, faithfully carried out and intelligently performed, will prevent, in the majority of cases, extension of membrane and in all cases the development of laryngeal stenosis, is evidenced by the small number of patients who suffer extension of membrane after entrance and the extremely rare event of a case of stenosis appearing after admission. The writer knows of only three cases developing stenosis after entrance, and in every one there was an undoubted history of exposure to a draught from an open window. Nevertheless, in opposition to all our efforts with this method of treatment, for which so much is claimed, there still confronts us a class of cases that furnishes a frightful mortality and makes diphtheria the most fatal of all the infectious diseases with which we come in contact. The cases referred to are always dangerous at any season of the year or in any epidemic, however mild that epidemic may be, and it is from this class of patients we have selected the cases for the antitoxin treatment.

The serum used in the writer's cases was made by Aronson, and furnished by Schering & Glatz, the agents for Aronson's antitoxin in this country. This solution was several times stronger than that first and last sent over by Aronson, called the "immunization solution," which corresponds to Behring's "normal antitoxin." Diphtheria poison sufficient to kill control animals weighing from 300 to 400 grammes in thirty-eight to forty-six hours is completely neutralized by .00025 to .00033 cubic centimetre of the stronger or concentrated solution. The age of the patient, the duration of the disease, and the severity of the case must all be taken into consideration in determining the dose to be given. The injections were made under all aseptic precautions, and in no case was there any sign of local inflammation following the injection. Instead of injecting the entire quantity in one place, the author selected several locations,—the interscapular region and the buttocks.

The treatment with the antitoxin was begun in the latter part of July, having previously used the weaker solution on several cases, and extended through the following two months. Twenty cases were selected for treatment during this time, and every case was one in which a most unfavorable prognosis would have been given at time of injection, while in all other hospitals where the serum treatment has been applied all cases have been injected without regard to the age or condition of the patient. The latter method gives a larger number of cases, but is not so severe a test, unless the treatment extends over a long period of time. Good results obtained in this way can be claimed as due to the season of the year or to the mildness of the epidemic. The author's cases differ in another important respect from most of those already reported,—*i.e.*, the treatment consisted entirely of injections of antitoxin, with the exception of irrigating all cases once on admission and two cases several times, for the purpose of removing membrane which completely plugged the nose. Of course, stimulation was given when indicated.

In drawing conclusions from the results obtained with the treatment by diphtheria antitoxin, we must first be satisfied that it has at least some curative power, however slight or insignificant that influence may be. If we grant that it has any appreciable influence when opposed to the toxin developed in a patient suffering with diphtheria, we must concede it is a specific for diphtheria; for the degree or amount of influence it exerts must, from the nature of the remedy, depend entirely on the strength of the serum and the care with which it is prepared.

Before deciding this question we may with benefit consider the results obtained by others who have given antitoxin a fair trial. The following reports have, with two exceptions, come from the hospital of Berlin:

Korte, through Vaswinckel, reports sixty unselected cases treated with antitoxin; of these, thirty were severe cases, with fifty per cent. recoveries; sixteen were quite severe cases, with eighty-one per cent. recoveries; fourteen were light cases, with one hundred per cent. recoveries; seventy per cent. of all cases recovered. Those cases having been excluded in which antitoxin could have had no effect, the total mortality was twenty per cent. Twenty cases were tracheotomized, with fifty-five per cent. mortality. The months previous to and following the treatment gave a mortality of 46.5 per cent. and in tracheotomies seventy-one per cent., or a total increase in recoveries under antitoxin of 26.5 per cent., and in tracheotomies a gain of sixteen per cent. He says no dangerous effects from the serum were observed; a few cases had some rash after the injection and in a few cases albumin appeared in the urine.

Rinne, through Schubert, reports thirty-four unselected cases, all of whom happened to be severe diphtheria in children, with a mortality of 17.9 per cent. The six patients who died were

tracheotomy cases. Autopsies showed death to be due to septic pneumonia in two cases, mechanical plugging of small bronchi in two cases (so that tracheotomy did not afford relief), pronounced myocarditis and nephritis in one case, and the remaining case died after being discharged from the hospital. The observer considers the serum an effective cure. The local symptoms improved rapidly, the effect upon general condition was more marked than any other (especially true of those cases with a very weak pulse), and a rash was noticed in several cases following injection. Much larger doses were used than experiments with animals would indicate.

Sonnenberg reports forty-four cases, with a mortality of twenty-five per cent. Nine tracheotomies give a mortality of 37.8 per cent. Excluding six cases in whom antitoxin was not indicated, the mortality in all cases was 13.3 per cent. Improvement of general condition, rapid disappearance of membrane, and fall of temperature were noticed in most cases.

Strahlman reports forty-eight unselected cases, with three deaths (two of sepsis and one of tracheotomy), showing a mortality of 6.2 per cent. The immunization power was tried in ninety-four cases, and seemed to protect from five and a half weeks to ten weeks. He summarizes as follows: "The changes caused by injection were marked, the membrane disappeared quickly, temperature fell considerably, and general condition improved very perceptibly."

Roux, Yersin, Martin, and Chaillou have studied clinically in L'Hôpital des Enfants Malades of Paris, and bacteriologically in the Pasteur Institute, over four hundred cases treated with their 1 to 50,000 antitoxin solution. They chose those months for the treatment in which diphtheria attains the highest mortality, and for comparison had the statistics of L'Hôpital Trousseau, where no serum was used, in the same city, covering the same period. The mortality for the four years previous to the treatment was 51.71 per cent. in three thousand nine hundred and seventy-one children. In four hundred and forty-eight cases entering the hospital during the serum therapy the mortality was 24.5 per cent.; covering the same period the mortality among five hundred and twenty cases at L'Hôpital Trousseau was sixty per cent. Therefore, 27.21 per cent. represents the exact benefit obtained by the antitoxin treatment as compared with other years in the same hospital, and shows a difference of 35.5 per cent. in favor of the serum as compared with the regular treatment for diphtheria in another hospital during the same epidemic and in the same city. The mortality among pure anginas, without croup complicating, was twelve per cent., while during the same period at L'Hôpital Trousseau the mortality was thirty-two per cent, and previous to antitoxin in the same hospital it has been 33.94 per cent. The mortality in croup with serum treatment was forty-nine per cent.; at L'Hôpital Trousseau for the same time it was eighty-six per cent., and had previously been at L'Hôpital des Enfants Malades 73.17 per cent. Excluding some cases in which the Klebs-Loeffler bacilli could not be found and others in which the serum treatment was not applied, the mortality among three hundred cases of true diphtheria treated with antitoxin was twenty-six per cent., or twenty-five per cent. better than any results obtained by former treatment for true diphtheria in the same hospital.

We find, then, of four hundred and eighty-six children (including operative cases) treated for true diphtheria by various observers, with different strengths of antitoxin solution, one hundred and sixteen died, or a mortality of 23.8 per cent. in a class of cases in which about fifty per cent. always die.

FLECHSIG'S OPIUM-BROMIDE TREATMENT OF EPILEPSY.

Every discovery which holds out a promise of new light on the treatment of epilepsy appeals to each member of the profession, for our list of efficient remedies is a short one.

The bromide salts, although they sometimes fail utterly to help, are still our best weapon against this dreadful malady. Of late years it has been found that antipyrin may intensify the action of the bromide, and that borax in large doses can occasionally be substituted for them to advantage, especially for night attacks, or given in combination with them. Zinc oxide, though one of the oldest remedies, deserves more attention than it generally receives; but it is often useless, and cannot always be borne in the large doses that are necessary to check the paroxysms. Nitro-glycerin in full doses accomplishes something towards the arrest of the minor seizures, and the dietetic and hygienic management of the patient is of great importance. Much was hoped, yet not much has been realized, from the disinfection of the intestinal tract. Meantime our dispensaries are crowded, one might almost say, with patients who drag out a dulled and anxious existence, often losing color and appetite under the in-

fluence of large doses of the bromides, and gradually failing in mental power.

Opium has been used occasionally and with more or less advantage for many years; but the method of employing it, recently suggested by Flechsig, is based on a somewhat new principle, and gives better results than the methods which have preceded it. The value of the treatment does not rest on the power of opium to stop the paroxysms,—although it sometimes does stop them,—but on its tendency to increase the efficacy of the bromides. Sometimes, also, the mental condition improves when the plan to be detailed has been carefully followed out.

The literature of this subject is well presented in the preliminary communication by Professor Flechsig, a later pamphlet by his assistant, Dr. Carl Salzburg, and a recent paper by Dr. Joseph Collins, of New York. We learn that the same method has been used with good results in the out-patient department for diseases of the nervous system at the Massachusetts General Hospital.

The treatment as originally described consists in giving opium in doses increased rapidly from 2 or 3 grains to 15 grains, daily, in three portions. The maximum dose should be reached in one or two weeks and continued for six weeks. At the end of this time the opium is suddenly withdrawn and either a potassium or sodium salt of bromide substituted for it. These are given, at first, in doses of 2 drachms daily; later, in smaller doses, decreased gradually to about 40 grains a day.

No great improvement is seen, as a rule, till the moment when the bromide is substituted for the opium, but, having appeared, it persists for a number of months at least; furthermore, when the attacks recur, as is likely to happen eventually, they are apt to be much lighter in form than before, while the mental condition, as stated, is sometimes better than it had been.

Dr. Collins's experience covers some fifty cases, many of which were under careful observation at the Almshouse Hospital for more than a year.

Unfortunately, the treatment has its shady side, as might have been anticipated. The danger of inducing the opium habit has not as yet shown itself, to be sure, as a real one, and can be guarded against to a great extent. On the other hand, the large doses which are said to be necessary are sometimes ill borne, and the first few days after the opium is withdrawn are apt to be trying ones for both patient and doctor, though, as a rule, nothing serious happens, and the patients are able to continue their attendance at the dispensary or office. Sometimes a few doses of morphine have to be given at this period.

The unfavorable symptoms most commonly met with are loss of appetite, and vomiting, constipation or diarrhœa, pains, extreme drowsiness or insomnia; but toxic hallucinations and delirium may occur, and sometimes even collapse, with feeble pulse. Yet who is there that has not seen cases where these and greater risks would have gladly been encountered for a fair chance of considerable gain?

Fortunately, it is the inveterate cases in which this method works best, and it is specifically advised that it should not be used in conditions of (1) status epilepticus, (2) plethora, or (3) where organic disease of the brain is present.

Finally, it is believed that the beneficial effects of the alternating opium-bromide method may be continued by an occasional repetition of the treatment; and, where the opium is not well borne, these repetitions might, perhaps, be made more frequent and the maximum dose of opium smaller than usual. It remains to be seen whether opium is capable of increasing the efficacy of other remedies besides bromide; such, for instance, as borax. On Salzburg's theory, which is that the opium exerts its favorable action simply by increasing the relative blood-supply, and hence the relative bromide-supply to the brain, it would seem not impossible that this might occur.

We shall look with interest for further reports, and need only remind our readers again that it is with the inveterate cases, where the other treatments have been tried without success, that they should make their experiments. —Editorial, *Boston Medical and Surgical Journal*, November 15, 1894.

TREATMENT OF BRONCHOCELE.

MARSH, in the *Birmingham Medical Review* for November, 1894, contributes a paper with this title.

Resection of the isthmus and adjoining parts of the lateral lobes, resection of the greater part of the gland, leaving only the parts in relation to the recurrent laryngeal nerves (Mikulicz), and removal of one lobe combined with resection of part of the remaining one, are the methods now most generally adopted in bilateral bronchocele. The principle of these three procedures is much the same, the difference being in the amount of gland removed. This raises again the question of function,—viz.,

the amount of gland that must be left for functional purposes. There are no data to show what the precise amount should be, but if one may judge from experiments on carnivora quoted by Horsley (*loc. cit.*), which show that at least one-third or, in some cases, one-fourth of the gland must be left to prevent the onset of fatal cachexia, it would seem advisable to leave at least the larger amount,—viz., one-third. Enough of the gland would, therefore, be left by any one of these methods.

The after-treatment of these cases is important. It is always advisable to use one or more drainage-tubes for at least twenty-four hours, to carry away the drainage of secretion from the cut surfaces of the gland; the hollows left must be well padded over and uniform pressure must be applied; the neck must be kept at rest by the use of a millboard or other collar; and the movements of deglutition minimized for the first day or two by rectal feeding. The patient should be placed in a semi-recumbent posture.

Looking at the series of cases collectively, the following points are of interest:

1. The sex, three out of five being males.

2. The fact that tracheotomy was necessary at the time of operation in two out of the five, though in one the tracheal opening was closed after removal of the growth.

3. In two cases out of the five the growth extended beneath the sternum, causing some antero-posterior flattening of the trachea.

4. The very much greater vascularity in the two female cases. In both the plexus of veins in the investing fascia was much more marked than in the other three cases, though this, of course, may only be a coincidence.

5. The uniformly satisfactory result, the primary union, and the subsequent decrease in size of the part left, and the freedom, so far, from any cachectic symptoms.

ELECTRICITY IN MIGRAINE.

LABBÉ (*Arch. d'Électricité Médicale*, October, 1894) reports a successful case. The patient, a cook, aged forty-five, had severe attacks for eight years, with increasing frequency. For over a year they had been of almost daily occurrence, causing her to abandon her calling. Many drugs had been administered. The menstrual function was regular. Treatment by insulation and the electrostatic brush discharge directed upon the face and head was continued, with occasional interruptions, from August until the following March. Each application lasted ten minutes, and the total number was thirty-eight. From the commencement the attacks were controlled, and the patient still remained quite free from migraine four months after treatment had been discontinued.—*British Medical Journal*, November 10, 1894.

OPHTHALMIA NEONATORUM.

In the *Birmingham Medical Review* for November, 1894, LLOYD OWEN states that in the treatment of this form of ophthalmia we must, first of all,—since it is clear that ophthalmia neonatorum is a disease derived directly from the mother, being due to infection from the vaginal discharge of the mother,—cleanse and disinfect the vagina before and during labor. For this purpose the vagina should be well washed out with a solution of perchloride of mercury in the proportion of 1 to 5000. This is a strength not likely to be poisonous, especially when used before labor is completed. But if any fear be felt of the poisonous effects of the perchloride of mercury, other antiseptics may be employed; for example, the vagina should be thoroughly irrigated by a good stream of a ten-per-cent. warm solution of biborate of sodium, or a solution of Condy's fluid, supplied from a reservoir hung five or six feet above the level of the patient. The vagina having been thus well cleansed by irrigation, a further disinfection by means of strong Condy's fluid, or boric acid, or a weak solution (one grain to the ounce) of chloride of zinc, or the same strength of the sulpho-carbolate of zinc, may be employed; and if the vagina be dry, an emollient ointment of boric acid in vaseline may be freely used. By these means the vaginal discharges are, for the time being, reduced to a minimum, and the chances of the child's eyes being affected enormously lessened.

Thus, then, the first and most effective prophylaxis is to be secured before the birth of the child. Supposing such methods neglected, abortive measures must be used.

Immediately after birth in every case of a child born of a woman having a vaginal discharge, the head, face, eyes, and hands should be well washed with a strong solution of borax, and three or four drops of a two-grain-to-the-ounce solution of nitrate of silver should be instilled between the eyelids, and the eyelids rubbed over the globe. This simple treatment in the hands of a distinguished surgeon to a maternity hospital (*credo* Leipsic) was regularly practised for six years, and out of seven

hundred and fourteen births there was not one child affected by ophthalmia; whereas before this plan was adopted, the proportion of children attacked was 10.8 per cent.

Once purulent ophthalmia is established in a child's eyes, the treatment requires great care. In the early stages, when any redness and some slight swelling of eyelids exist and the discharge is serous with floculi of lymph, strong local applications are not justifiable. The best applications in this stage are frequent irrigations with a weak solution (1 in 3000 or 4000) of perchloride of mercury and the brushing over of the palpebral conjunctiva with a two-grain solution of nitrate of silver, together with the free introduction between the eyelids of an ointment of ten-per-cent. iodol in vaseline. If, in spite of these means, inflammation should become more active and the discharge distinctly purulent, there are two or three especial remedies of distinct value. They are the nitrate of silver, the perchloride of mercury, and the chloride of zinc. Each of these remedies must be applied by means of a brush to the conjunctiva to be effectual. To do this, a fairly stiff-haired brush must be used, and after thorough cleansing of the conjunctiva of the lids and fornix by means of irrigation with a weak antiseptic, solutions of these substances must be well brushed over the surface of the palpebral conjunctiva, and the brush swept carefully and repeatedly into the deep folds of the fornix.

The strength of solutions most useful are: of nitrate of silver, ten grains to the ounce of water; of the perchloride of mercury, 1 in 1000; of the chloride of zinc, four grains to the ounce. After their use all superfluous quantity must be removed, in the case of nitrate of silver by a solution of common salt, in the others by free washing with warm water. Irrigation should be employed hourly with a solution of ten per cent. of boric acid in a solution of 1 in 5000 of perchloride of mercury or weak aqua chlori. These fluids should be used slightly warm. Irrigation has now taken the place of syringing between the eyelids, as being a much more trustworthy method of cleansing.

If the cornea show signs of becoming affected, the case becomes more serious, and, instead of relaxing in the use of the remedies just mentioned, there must be additional care in their use. Atropine must be used in addition, drops of the following form being used: four grains of the sulphate of atropine and two of nitrate of silver to be dissolved in an ounce of water, and 2 drops instilled into the eye three times daily. The following powder should be dusted once daily into the conjunctiva, after cleansing by irrigation, as before mentioned: boric acid, three parts, quinine, one part.

If ulceration of cornea go on, the margins of the floors of the ulcer should be lightly touched with the electric cautery. If perforation threaten, paracentesis of the cornea should be made. Success, however, does not follow the employment of these means in ulceration of the cornea in ophthalmia neonatorum in such degree as in the treatment of the ordinary forms of corneal ulcer in more advanced life, probably owing to the delicacy of the infant's tissues and to the presence of such considerable quantity of infecting material.

An important fact to remember is that the corneal is secondary to the conjunctival affection, and that under the steady treatment of the conjunctiva, the corneal trouble advances most surely to recovery.

In many cases of ophthalmia neonatorum, after the acute symptoms have subsided, a gleety discharge from the conjunctiva remains. This must be checked for obvious reasons, and especially because it may cause acute or chronic inflammation of the lachrymal sac, a condition most difficult to treat in infants.

In the lingering stages of the termination of an attack of ophthalmia neonatorum, change of remedies is necessary. The most useful are chloride of zinc, sulpho-carbolate of zinc, acetate of zinc, sulphate of copper, lapis divinus (in proportions of a grain or two to the ounce), and ointment of the yellow oxide of mercury (one to two per cent.) or iodol (five per cent.).

ELECTRICAL TREATMENT OF EXOPHTHALMIC GOITRE.

BORDIER (*Archives d'Électricité Médicale*, October, 1894) contributes a paper on the treatment of exophthalmic goitre by the induction coil, and reports two cases much benefited. The applications by Vigouroux's method were: (1) to the facial nerve (upper branch) and to the orbicularis palpebrarum for half a minute each side; (2) to the neck between the hyoid bone and the anterior border of the sterno-mastoid, the electrode pressed deeply over the carotid artery, duration one and a half minutes on each side; (3) over the thyroid swelling by an electrode of larger surface for five minutes; (4) over the præcordium for three minutes. The thyroid muscles were also made to contract for a few times during the sitting. Treatment repeated three times a week. Indifferent electrode applied to the nape of the neck throughout. The results were decidedly favorable. The

same journal also contains a paper by Deliage on the use of the continuous current in exophthalmic goitre.—*British Medical Journal*, November 10, 1894.

FEEDING BY THE STOMACH-TUBE AFTER INTUBATION.

MORRISON (*Boston Medical and Surgical Journal*, February 7, 1895) reports twenty-eight cases of intubation, of which number twelve recovered. He holds that we have, in feeding by the stomach-tube after intubation, and in all other cases where there is interference with the act of deglutition, a method which is easy of application, which permits a definite amount of food to be placed in the stomach, thus fortifying the system against combined exhaustion and septic infection, which obviates both the discomfort and pain produced by the futile attempts at swallowing, and which will also prevent the dangers of deglutition,—*i.e.*, pneumonia or suffocation. If extended experience shall show that it possesses these merits, it seems probable that we shall find an increase in the percentage of children saved from this most insidious and deadly disease, and that much of the incessant care and trouble in their management will be prevented.

TRAUMATIC DERMOID CYSTS.

LE FORT (*Rev. de Chir.*, December, 1894) reports two new cases of traumatic dermoid cysts, and gives the following conclusions, based on a careful study of these growths:

1. Traumatic dermoid cysts are met with almost exclusively in the hand and in the iris.

2. They are produced by the development of a fragment of skin forced into the deep tissues by some wounding agent.

3. It has been proved by experiments that the displaced fragment of skin is usually very small and formed simply of the epidermis.

4. Consequently traumatic dermoid cyst is in most instances purely epidermic.

5. Cutaneous fragments can be detached more readily in the hand than elsewhere; hence the much greater frequency of the cysts in question in this region, which, moreover, is especially liable to be injured.

6. The displaced fragment of skin may not be completely detached; it may still be connected with the skin of the hand, and may maintain its connection with the cutaneous vessels, nerves, and glands. Thus may be explained those cases of traumatic cyst the walls of which show papillæ and even hairs.

7. It is not improbable that the fragment of skin displaced and embedded by an injury may consist not merely of epidermis, but also of a more or less abundant dermic layer.

8. In every case, however, the embedded fragment forms but a part, and often a small part, of the wall of the cyst, the rest of this wall being formed by the cicatrization which starts from the margins of the deep graft. This cicatrized part of the wall is always of simple formation; it contains neither papillæ nor glands, and the epidermis is always in direct contact with the connective tissue; hence the necessity of a very careful and thorough removal of the growth. The traumatic origin of dermoid cysts in the iris was first suspected by Hulke, who pointed out, in 1869, that in fifteen out of nineteen recorded cases an injury had preceded the appearance of the growth.

OPERATIVE TREATMENT OF WRY-NECK.

MIKULICZ (*Centralbl. f. Chirur.*, No. 1, 1895), dissatisfied with the results both of subcutaneous and open division of the sterno-mastoid in cases of wry-neck, advocates almost total removal of the contracted muscle, the posterior part of its upper extremity, where it is traversed by the spinal accessory nerve, being left. He has practised this operation on seventeen cases with success, the only bad result having been disfigurement of the neck caused by the absence of the muscle. Examination of the removed muscle in these cases has convinced him that wry-neck is the result of a chronic inflammatory condition (myositis fibrosa) involving the whole of the sterno-mastoid. This condition he attributes in congenital cases rather to compression of the muscle during a long and difficult labor than to laceration. The so-called hæmatoma of the sterno-mastoid sometimes observed in infants is not due, he holds, to effusion of blood, but to thickening and induration of the inflamed muscle.—*British Medical Journal*, February 2, 1895.

RESECTION OF THE BLADDER.

CHEVALIER (*Archiv. Gén. de Méd.*, tome ii., 1894), in a paper on this subject, classifies the operations as partial or total. Partial resection may be extraperitoneal or peritoneal, or may involve both surfaces. When practised for the removal of tumors, the resection may involve simply the tumor and the zone of infiltration, or may include the entire thickness of the bladder, measures being taken in this case to

prevent perivesical infection. In man, excepting the trigone and the region about the ureters, the extirpation of the entire bladder is possible. Partial extraperitoneal resection of the anterior wall has been frequently and successfully practised. Excepting when a neoplasm is strictly limited to the extraperitoneal portion of the bladder, it is best to make the resection from within outward. As to resection of the vesical neck, Chevalier bases his results upon cadaveric operations. The lateral walls of the bladder can be rendered extraperitoneal, since stripping the peritoneum in this region is very easy. In operating, the exact position of the tumor is determined by the ordinary cystotomy. The finger is passed behind the pubis, freeing the anterior and lateral surfaces of the bladder; then with a pair of curved scissors the entire zone of infiltration is cut away. There is very little hemorrhage, and what bleeding occurs is readily checked. The defect in the tissue is closed by sutures placed either vertically or antero-posteriorly, according to the position of the wound. Then the opening made into the anterior wall of the bladder is closed and a permanent catheter is placed in the urethra. When the tumor involves the trigone and *bas-fond*, resection must be made from within outward. Before undertaking this the ureter should be catheterized. If the ureter is not involved this canal is readily separated. The resection should be carried to, but not through, the rectal wall. If the tumor is very large, the projecting portion may first be removed, and then its point of attachment may be dissected out; by means of tenacula the base of the bladder may be drawn upward and made more accessible. If the ureter is involved, all diseased tissue should be taken away. The healthy end of the ureter can then be stitched to the bladder or may be allowed to remain at the bottom of the wound resulting from extirpation. Other alternatives are to secure the ureter in the rectum, but this is not advisable; to the vagina, which is sometimes necessary; to the external surface, which at times is the only feasible procedure; or, finally, it may be ligated and left in the abdomen, but only when implantation into the bladder is impossible. Partial resection of the peritoneal surface of the bladder has not given very encouraging results. Clado's peritoneo-vesical resection is thus performed: through the ordinary suprapubic cystotomy wound the tumor is first separated, and as much of a pedicle as possible is formed. By means of fingers placed behind the tumor an effort is made to double the bladder-wall upon itself, which will bring together the peritoneal surfaces just beyond the line of resection. This whole turned-in mass is seized in a pair of long curved forceps. The tumor is then separated, the pedicle being seized with smaller forceps placed in sound tissue. The bladder is tamponed with iodoform gauze, the cystotomy wound partly closed, laparotomy performed, and suture applied, by means of which the two peritoneal surfaces held in apposition by the long curved forceps are permanently secured. Two or three lines of suture may be applied. The abdominal wound is then closed, and the neoplasm, together with its peritoneo-vesical base of attachment, which has been turned in, is removed, the mucous membrane being brought together by suture. If the tumor is very large it may be removed by the galvano- or thermo-cautery. Hypogastric drainage is employed.

Total resection of the bladder has always been fatal in men. Clado has had one success in the case of a woman, the ureters having first been secured in the vagina and then twenty days later the bladder having been resected.

BRAIN SURGERY.

NASSE (*Berl. Klin. Woch.*, January 21, 1895) relates two interesting cases of perforating wounds of the skull:

CASE I.—A man, aged forty-three, was admitted twelve days after a heavy chisel had fallen upon his head. He was apathetic and complained of headache. He was aphasic, and the lower branches of the right facial were paralyzed. The fundus oculi was healthy. Later motor weakness appeared in the right side. On trephining, a small perforation was found in the dura mater, through which softened brain-tissue escaped. The dura mater was incised and the contents of an abscess in the brain substance evacuated. Improvement began at once. The aphasia completely passed off in three weeks, and the lower branches of the facial improved later. The progress in the right extremities was slow, a difference in the strength of the two sides still persisting. This was an example of a subacute, subcortical, traumatic abscess near the motor speech centre. Its position exactly explained the symptoms.

CASE II.—A boy, aged six, received an injury to the skull from a piece of falling wood containing a nail. On the next day he was somnolent, and vomited. On the third day there was disturbance of speech as well as clonic spasm in the cheek, extending later to the arm. On admission, there were symptoms

of a focal lesion. On trephining, the inner table was found splintered, some of the splinters having been driven into the brain substance; these were removed. There was a focus of softening, but no abscess. The recovery was complete. Nine days later an osteoplastic operation was performed by which the defect in the skull was closed.—*British Medical Journal*, February 2, 1895.

TRACHEOTOMY FOR THE RELIEF OF URGENT SYMPTOMS DURING GENERAL ANÆSTHESIA.

PONCET (*Lyon Médical*, January 13, 1895) closes an article on this subject with the statement that when, under general anæsthesia, there is apparent death, tracheotomy is absolutely indicated; that it is a means of prime importance upon which the surgeon should count and upon which he should always rely when other methods have failed. An anæsthetic should never be given without considering this aspect of the case,—that is, no matter what operation the surgeon is performing, he should have ready at hand the instruments required for tracheotomy. This operation, which allows of artificial respiration to its fullest extent, or direct insufflation by means of a canula, and which does not interfere with the rhythmical tractions of the tongue, is likewise indicated in asphyxia from other causes, or in prolonging syncopal conditions, no matter how these may have been produced; as, for instance, apparent death from electrization or from inhalation of toxic vapors or gases.

RADICAL CURE OF INGUINAL HERNIA.

GALLAY (*British Medical Journal*, February 2, 1895) reported before the First Indian Medical Congress the results of thirty-eight operations for the radical cure of inguinal hernia performed in the last four years. Half of these were complicated cases, and in four the operation proved fatal, death being due in one to tetanus, in the second to peritonitis, in the third to prolonged suppuration, and in the fourth to asphyxia after the return to the abdominal cavity of a large mass of intestine and omentum which for a long period had rested in the scrotum. In twelve of the successful cases the wound had healed by first intention, and had completely closed before the end of the third week; in twenty cases cicatrization had been delayed, and in two there had been free suppuration. The method employed in every instance was that devised by Bassini. Fourteen patients remained free from indications of recurrence.

DOUBLE CASTRATION UNDER COCAINE FOR HEAD SYMPTOMS, ETC., DUE TO INJURY OF TESTICLES.

MARSHALL (*Virginia Medical Monthly*, January, 1895) reports the case of a man, aged forty-seven, who had lost the power of sexual intercourse, as he supposed, from an injury by lifting. The testes and cord became tender on pressure and were at times extremely painful, the cremaster contracting spasmodically and producing severe headaches. The patient's mind became greatly affected; he drifted into a melancholic state, even refusing to take food.

Marshall injected a two-per-cent. solution of cocaine, using, in all, two drachms of the solution. He then removed both testicles. This was done without pain. The results of the operation were highly satisfactory. The pains were cured and the head symptoms disappeared, the patient's mind remaining perfectly clear.

RAPIDLY SPREADING GANGRENE OF THE UPPER AND LOWER EXTREMITIES.

WILLIAMS (*British Medical Journal*, February 2, 1895) had brought to him a man of fifty-three, who had a dislocated shoulder reduced. Within a few hours after this the hand became cold and dark and without feeling. Two days later it was black, cold, and shrivelled, and at intervals up the forearm and arm and on the pectoral muscle and in the axilla were large purplish-black spots, covered with bullæ containing black fluid. Pulsation could be felt high up in the axilla, but not in the radial or brachial artery. The arm was removed after a delay of a few days by an incision at the deltoid. The patient recovered. The artery was firmly plugged from the axilla down to the hand; the veins were uninjured.

The second man, twenty-six years old, was seen seven days after his thigh had been crushed between buffers. At the time of the accident serious injury of the deep parts was not suspected, since the bones were not broken nor was the skin injured. The leg became anæsthetic, black, cold, and covered with huge bullæ. At the time the patient was admitted to the hospital, gangrene extended three inches above the knee. Amputation at

the upper third of the thigh was performed, and this was followed by rapid recovery. Both popliteal artery and vein were ruptured just below Hunter's canal.

Williams also relates the sequel of a case previously reported, in which the superficial femoral was tied for popliteal aneurism, and the external iliac for aneurism of the femoral on the same side. He has since tied the femoral in the same patient, on the other leg, for popliteal aneurism, about twelve months ago. The patient made an excellent recovery and has been at work since. The report of this case appeared about two years ago.

INTERNAL STRANGULATION BY A BAND IN THE ILEO-CÆCAL REGION.

BENOIT (*Revue de Thérapeutique*, December 15, 1895) reports a case of internal strangulation by a band in the ileo-cæcal region. This was treated successfully by cœliotomy. He states that it is important to recognize that, aside from strangulations caused by the appendix or by diverticula and epiploic fringes, the cellulo-fibrous bands which are so frequently the cause of strangulation are most frequently found in the ileo-cæcal region. A knowledge of this fact is often a means of saving time, since the surgeon directing his first search here will usually come upon the cause of the trouble.

CASE OF ENCYSTED STONE IN THE BLADDER, WITH RUPTURE OF THE CYST.

ROYDEN (*British Medical Journal*, February 2, 1895) reports the case of a man of sixty-four who suffered from hæmaturia for nearly ten years. This was intermittent, and there were absolutely no other symptoms. In September of 1894 the bleeding persisted for many days. The patient was repeatedly sounded for stone; this could not be felt, but cystitis was set up. Subsequently the patient was seized with two or three sharp attacks of pain and passed some fragments of concretion. Following this he apparently regained his health and the urine became normal; but shortly the former symptoms developed again, and suddenly, after several weeks of pain referred to the end of the penis, and vesical tenesmus, the patient passed into collapse, with distended abdomen and all the signs of peritonitis. Autopsy showed a diverticulum containing a quantity of concretions. The thin walls of this diverticulum had ruptured, allowing urine to escape into the general peritoneal cavity.

STATISTICS OF RENAL SURGERY.

A paper has recently been published by DR. JAMES ISRAEL, giving the results of eighty-one capital operations on the kidney performed by him during the past eleven years, with a mortality of 13.7 per cent. Of these operations, thirty-seven were nephrectomies, of which six were fatal. This result is exceptionally favorable, as compared with the results obtained by other surgeons. Thus, of the one hundred cases collected by Barth in 1892, sixty-two either died from the operation or from metastases or intercurrent troubles (*Boston Medical and Surgical Journal*). In nineteen of Israel's cases the kidney was extirpated for hydronephrosis, for pyonephrosis, and for abscess of the kidney; four of these patients (twenty-one per cent.) died. The nine patients suffering from hydronephrosis all got well. In twelve cases the extirpation was performed for malignant growths; only two of these patients died. Israel attributes this small mortality less to the skill of the operator than to improvement in the means of diagnosis, which enables the surgeon to distinguish renal tumors from divers other abdominal growths, and thus perform ablation of the kidney without opening the peritoneum. Moreover, the greater precision in diagnosis obtained by the surgeon enables him to operate earlier when the tumor is still small and has not acquired attachment to surrounding parts. Thus, in two cases, the tumor, which had not exceeded the size of a cherry, had been recognized by palpation while the patient, lying on the sound side, was taking a deep breath. Tumors of the liver coming down in front of the kidney may be a cause of mistaken diagnosis. Thus, in one case the author found at the operation, instead of the supposed renal tumor, a tumor the size of the two fists descending from the lower surface of the liver. He promptly closed up the wound. In another case, a young girl of fifteen, he found, instead of a renal tumor, an angiosarcoma of the liver, which was removed with success.

Apart from the data afforded by palpation and the detection of particles of the neoplasm in the urine, even when the bladder is found intact by the cystoscope, there exists no certain sign of malignant tumor of the kidney. It cannot even be said that the type of the hæmaturia is characteristic. Israel suggests as of some value a diagnostic method which con-

sists in plunging the needle of a Pravaz syringe into the substance of the tumor and obtaining by suction a little of its contents. In three cases he has succeeded in thus removing enough of the tissue elements to enable him to make a diagnosis of the neoplasm. A second cause of lessened mortality in nephrectomy operations is the exclusive employment of the extraperitoneal method. It is in this way that Israel has removed all the tumors of the kidney—even the most voluminous—on which he has been called to operate. There need be no fear in making a large incision, transverse or oblique, curved or angular. The kidney should first be separated from the fat in which it is embedded, then lifted up, tied off, and removed ; then, by the aid of long retractors with large blade, and polished so as to reflect the light, the retroperitoneal space is brought well into view, so that all bleeding can be stopped and any accidental perforations of the peritoneum sutured. Lastly, the wound is drained—not packed—and closed with silk sutures.

In one of Israel's fatal cases symptoms of iodoform-poisoning set in, to which he attributes the death. Since then he has abandoned the use of antiseptics in dressings of the abdominal wound. In another case where a cancer of the right kidney was extirpated, the patient, a feeble and cachectic woman, was kept under chloroform two hours. She died at the end of forty hours, and at the autopsy there was found recent cloudy swelling of the parenchyma of the left kidney, which the author considered as the cause of death. This alteration, he says, can only be explained by the toxic action of chloroform on a person already greatly enfeebled. He has since investigated the action of chloroform on the kidneys. In seventeen cases of extirpation of one kidney, he found in fourteen signs of a slight affection of the other kidney after the operation. This affection is generally of short duration. In a patient who underwent an operation for cysto-sarcoma, he observed a transient albuminuria. Six months later this same patient underwent another surgical operation, and again for several days albumin and casts were found in the urine. These facts seem to demonstrate the noxious action of chloroform on the renal epithelium.

A very interesting case of ureteritis was observed by Israel in a man affected for eight years with severe attacks of renal colic on the left side. The diagnosis of renal calculus was made. February 10, 1893, an incision was made over the kidney, which was exposed from the convexity to the hilum, but no calculus was found. As the sufferings of the patient were aggravated instead of benefited by the operation, two months afterwards a long incision was made in the same region, and the ureter was laid bare in its whole length. It was found indurated and very much thickened, and at least three times the normal diameter. By an incision in the pelvis a No. 10 bougie was easily passed down to the bladder. This opening was not closed, in hope that the free flow of urine by the wound would put an end to the sufferings of the patient. This was not the case, and a few days later it was decided to perform ablation of the kidney, which presented to a notable degree the alterations of hydronephrosis by retention. The patient made a speedy recovery, and has been entirely relieved of his pains. Israel explains the obstinate and continuous renal colics in this case by the fact that the ureter was converted into a rigid tube by the chronic inflammation, and could no longer expel the urine by its periodical and forcible contractions. There was, hence, stasis of urine and elevation of pressure sufficient to cause colics.

Nephrectomy was practised in four cases of renal tuberculosis. One of the patients died soon after of tuberculous meningitis ; the others survived the operation and have kept well to the present time. In two cases of renal syphilis, nephrectomy was performed with success. In three cases of urinary calculus attended with anuria, the operation of nephrolithotomy was performed. Two of these patients died, the operation having been too long delayed ; in fact, to be successful, the lithotomy ought to be practised early, at least within forty-eight hours of the onset of the anuria. In the patient that survived, the secretion of the right kidney was resumed immediately after the removal of the left kidney. This fact seems to indicate the possibility of a reflex anuria by arrest of the secretion of a kidney by reason of occlusion by a calculus of the ureter of the other kidney. The author has also seen the irritation of the pedicle of an extirpated kidney produce an arrest of the secretion of the other kidney. A drainage-tube had caused this irritation. When this was removed, the quantity of urine increased from five hundred to two thousand cubic centimetres, with cessation of the pain which before had existed at the site of the operation.

In cases of floating kidney, Israel is, on general principles, opposed to operative interference. He does not believe that the symptoms observed are, in general, the consequence of the abnormal mobility of the kidney. Often the physician has to do with women that are

nervous or who present some affection of the genital organs. Others have enteroptosis, and it is the relaxation, the fall of the viscera, which is the cause of the functional troubles, rather than the floating kidney. Moreover, we often observe hysterical nephralgias when the kidney is normally situated; also many women present no symptom, although one of the kidneys is mobile. Lastly, by an appropriate treatment, we may sometimes cause disappearance of the symptoms wrongly attributed to renal ectopia; and, on the whole, it may be affirmed that the medical treatment of this affection is much more important than any local treatment.

Nevertheless, nephropexy has its indications, as when the surgeon finds himself in presence of a case of floating kidney accompanied by those paroxysms of renal pain which are the prodrome of intermittent hydronephrosis. Likewise, he will have recourse to nephropexy when the patient complains of continuous pains, which seem certainly due to displacement of the kidney, and which resist all medical treatment.—*Medical Record*, January 26, 1895.

TREATMENT OF PSEUDO-ARTHROSES OF THE LONG BONES.

DELORME (*Ac. de Méd.*, August, 1894; quoted from *Revue Thérapeutique*, January 18, 1895) describes a new method of treating what he calls pseudo-arthroses of the long bones. This practically consists in driving one of them into the medullary canal of the other. He thus treated a case of ununited fracture caused by a gunshot wound, with perfect success.

DIAGNOSIS AND TREATMENT OF STENOSIS OF THE PYLORUS.

EINHORN (*Medical Record*, January 19, 1895), after a discussion upon the diagnosis of stenosis of the pylorus, illustrated by cases, briefly discusses treatment as follows:

The rational treatment of stenosis of the pylorus consists in establishing a wider outlet between the stomach and intestine. What shall we do in those cases where either surgical interference does not appear advisable, or patients refuse an operation? In these instances we shall apply the newer methods of treatment of the stomach. We shall advise small and frequent meals. In the benign stenosis the greater part of nourishment will consist of albuminates, whereas in cancer starchy food plays an important *rôle*. In both instances milk, kumiss, or matzoon, given in small quantities, are very suitable. In both instances lavage, applied in the fasting condition, appears to be very useful. After the lavage the spraying of the stomach with one- to three-per-mille solution of nitrate of silver may be advantageously administered. Rectal alimentation will greatly aid the usual nutrition for a time, and rectal injections of water, which have been first recommended by Unverricht, will be of great benefit when thirst is present and the amount of secreted urine decreased.

In benign stenosis of the pylorus the application of massage (ten minutes twice daily) to the gastric region can be warmly recommended. Likewise the administration of alkalies in existing hyperacidity, and the application of the galvanic current when there are severe pains, may be profitably tried.

Cancerous stenosis of the pylorus hardly admits of any treatment. Condurango given when there is anorexia, and chloral hydrate (a tablespoonful of a three-per-cent. solution every two to three hours) when pains, as has been recommended by Ewald, are the most reliable and efficient medicaments.

TOTAL EXTIRPATION OF THE STOMACH.

La Tribune Médicale for January 16, 1895, briefly outlines Langenbuch's contribution on this subject. Three patients were thus treated, one surviving. The first case was a woman fifty-eight years old, exhibiting classical symptoms of cancer of the stomach, with tumor in the left hypogastrium. On opening the abdominal cavity, the stomach was found much contracted, and exhibited on its posterior surface an extensive cancerous infiltration. No metastases were found in the neighboring organs. The stomach was drawn out from the belly and section was made at the pylorus and the cardiac extremities, after division of the epiploon. The portion removed represented seven-eighths of the stomach. The pylorus was stitched to the remains of the cardiac orifice, making a cavity about the size of a hen's egg. Fearing lest the sutures might give way, the new stomach was fixed in the abdominal wound by passing behind it a piece of iodoform gauze; the rest of the abdominal wound was closed. The operation lasted one and a half hours.

In the evening the patient received a little milk; the next day there was slight fever. On the third day meat was given. Convalescence was rapid and cure was accomplished in three weeks.

The second case was a man fifty-six years old. Almost the entire stomach was removed and the pyloric and cardiac ends were stitched together in the parietal wound. On the third day the sutures gave way and the dressings were soiled by the contents of the stomach. Effort was then made to feed the patient by a catheter passed into the duodenum through the stomach opening. This method failing, the patient was fed by the rectum. He perished on the sixth day from inanition. On autopsy, peritonitis was found strictly limited to the region where the sutures had given way.

The third case was a man sixty-two years old, suffering from cancer of the pylorus. After pylorectomy, the line of suture was secured in the parietal wound and was protected behind with iodoform gauze packing. Unfortunately, the patient was affected with bronchitis, and the coughing caused the stitches to give way, so that alimentation could only be accomplished by a catheter introduced into the duodenum, and the patient perished of inanition on the twenty-third day.

TREATMENT OF VARICOSE VEINS BY LIGATURE OF THE INTERNAL SAPHENOUS.

WINIWARTER (*Annales de la Soc. Méd. Ch. de Liége*, No. 11, 1894; quoted from *Revue de Thérapeutique*, January 18, 1895) shows that by multiple ligature or excision of the veins peripherally placed the general cause of dilatation is not affected and the recurrences are frequent. Trendelenburg's method marks, however, a distinct advance in the treatment of this affection, since radical cure is accomplished by it. This consists in ligature of the internal saphenous vein, into which, of course, empty all the peripheral veins. Trendelenburg has shown that, because of insufficiency of the valves of the saphenous, the blood which circulates in this vessel, together with that in the femoral vein and external primitive iliacs, forms a column which keeps up a constant high pressure in the veins of the leg when the patient is standing. From this etiology of the affection radical treatment is suggested. In the operation, Esmarch's tube is applied to the extremity of the thigh, the operative field is carefully cleansed, the internal saphenous is exposed at the junction of the upper and middle third of the thigh by a longitudinal incision over the sartorius muscle. After having freed it, it is divided between two ligatures, the wound is then sutured, and a very careful antiseptic dressing applied. The whole limb is then enveloped in cotton, bandaged firmly, and kept immobilized for eight to ten days. Sometimes the enlarged veins more peripherally placed are also removed. Rebellious varicose ulcers quickly yield to this treatment.

TREATMENT OF HYDROCELE.

BUSCHKE (*Deut. Med. Woch.*; quoted from *Revue de Thérapeutique*, January 15, 1895) thus treats hydrocele: In the lower portion of the sac is driven a trocar. The contained liquid is allowed to escape, the sac is washed out with a three- to five-per-cent. solution of carbolic acid, the trocar is then driven through the sac and brought out at its upper portion, and through a canula is passed a drainage-tube with two or three lateral openings. This allows the inflammatory secretion to escape without accumulation into an aseptic pressure dressing. No anæsthesia is required. Drainage is removed on the fourth to sixth day, and a dressing applied and left in place until cicatrization is complete. This requires eight to ten days. This operation is especially applicable in simple hydrocele.

ROUND ULCER OF THE VAGINA.

WLODZIMICRZ SKOWRONSKI describes a case of perforating ulcer of the anterior wall of the vagina in a multipara thirty-seven years of age. It was half a centimetre in diameter, rough, with granulating detritus, gray in color, and bleeding on touch. The ulcer was extirpated and the wound closed with silver-wire sutures. The patient, who was anæmic, improved in health. Microscopical examination showed an absence of mucous membrane, the submucous layer being partly intact.—*Universal Medical Journal*, January, 1895.

THE TREATMENT OF INOPERABLE MALIGNANT TUMORS WITH THE TOXINS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS.

COLEY (*Medical Record*, January 19, 1895) publishes a further communication on the above subject which is well worth careful consideration. In the preparation of the toxins of erysipelas and prodigiosus, ordinary peptonized bouillon is put into small flasks, containing fifty to one hundred cubic centimetres, which, after proper sterilization, are inoculated with the streptococci of erysipelas and allowed to grow for three weeks at a temperature of 30° to

35° C. The flasks are then inoculated with bacillus prodigiosus, and the cultures allowed to grow for another ten to twelve days at room temperature. At the end of that time, after being well shaken up, the cultures are poured into sterilized glass-stoppered half-ounce bottles, and heated to a temperature of 50° to 60° C. for an hour, sufficient to render them perfectly sterile. After cooling, a little powdered thymol is added as a preservative, and the toxins are ready for use. The toxins when prepared in this way are very much stronger than when filtered through a Pasteur, Chamberland, or Kitasato filter, the active principles contained in the germs themselves being preserved. If, as is sometimes the case, the preparation is found to be too strong to use with safety, it can be diluted with glycerin or sterilized water.

The best method of making the bouillon is to soak a pound of chopped lean meat overnight in water. In the morning strain it through a cloth, make up to one thousand cubic centimetres, and boil for one hour. Then filter through a cloth, add peptone and salt, neutralize and boil again for an hour. The bouillon will then pass through filter-paper perfectly clear, and be ready to put into the flasks. It is not, however, necessary to neutralize the bouillon, as the streptococci will grow even more readily in acid bouillon, and the resulting preparation is, if anything, stronger than when neutralized bouillon is used.

In order to keep up the virulence of the cultures they are put through rabbits in the following way: The hair of the ear is clipped close with a pair of scissors, and the skin washed with weak carbolic acid and then sterilized water. A minute quantity of a bouillon culture, forty-eight hours old, is then injected subcutaneously in four or five different places in the ear. Forty-eight hours later, after again washing the ear with carbolic acid and sterilized water, a flat needle sterilized in the flame is inserted under the skin at or near a point of inoculation, and the layer of the skin is cut off with a sharp sterilized scalpel. The piece of skin is then rubbed well over the surface of an agar tube with a thick platinum-wire needle. After twenty-four hours in the incubator the colonies of streptococci will show as minute white specks, and from them a pure culture can be obtained. If the agar is made with seventy-five per cent. of bouillon and twenty-five per cent. of urine, the streptococci will grow more freely than if bouillon alone is used. The dose of this preparation varies from 1 to 8 minims. Coley has had a temperature of 105° F. follow the injection of 2 minims. He usually begins with the minimum dose, and gradually increases until the desired reaction—*e.g.*, temperature 103° to 104° F.—is reached.

In summarizing his cases thus far treated, Coley states that up to May 31, 1894, he had treated with mixed toxins twenty-five cases of inoperable sarcoma, eight of inoperable carcinoma, and three of sarcoma or carcinoma. In the cases of carcinoma he had had marked improvement in a number of cases, but no cures. The cases were all very advanced recurrent tumors. In sarcoma there were six cases in which he considered there was a reasonable hope of permanent cure. Six months have passed since then, and none of the six cases have shown any recurrence. Of two other cases which were merely mentioned among the tabulated cases as improving, one has gone on to entire disappearance of the very large tumor and promises to be a cure, and the other, a six-times-recurrent sarcoma of hand, is in perfect health at present, nearly two years since the beginning of the treatment. Since May 31, 1894, he has treated twenty-four cases of malignant tumors, all inoperable and mostly recurrent, with the mixed toxins. Of these cases, thirteen were sarcoma and eleven carcinoma. In many of the cases of carcinoma the injections had an undoubted retarding influence, and in some of the cases the improvement was extraordinary, but in no case did the tumor entirely disappear. In the sarcoma cases the effect was far more marked, and although in a number of the cases the disease was so far advanced that there could be no possible hope of recovery, still, the powerful controlling influence of the toxins was demonstrated, and had the patient's general condition permitted a prolonged use of the injections, the results might have been otherwise.

In three of the thirteen cases the sarcomas have entirely disappeared, and although no great length of time has elapsed, the results in Coley's older cases make it improbable that relapse will occur. Of a total of thirty-eight cases of inoperable sarcoma, therefore, nine cases promise to be permanently successful.

With the exception of the first, all of these cases were treated with the mixed toxins of erysipelas and bacillus prodigiosus, the streptococcus cultures having been obtained from a fatal case of erysipelas. That the bacillus prodigiosus plays a very important part in the action of the toxins on sarcoma he has repeatedly demonstrated by using the two singly and combined. The prodigiosus used alone has a

marked effect in causing degeneration and absorption of sarcomatous tissues, but the combined action of the two toxins is greater than when either is used alone. He has also found by experiment that sarcina used with erysipelas has a similar effect.

SUBCONJUNCTIVAL INJECTIONS OF MERCURIC BICHLORIDE.

A valuable and exhaustive paper on this subject is published by CHARLES STEDMAN BULL in the *New York Medical Journal* for January 19, 1895, in which he reaches the following conclusions:

The pain induced by the injections is always severe, in spite of the persistent and careful use of cocaine.

The reaction is apt to be severe, and sometimes very severe.

The only classes of cases in which the sublimate injections seemed to exert any positive effect in allaying the severity of the symptoms and shortening the duration of the process were those of scleritis and acute irido-choroiditis of the non-syphilitic type.

The method of treatment by subconjunctival injections of sublimate solutions is still on trial, and should not be promiscuously employed in all sorts of cases as part of, or in place of, the routine treatment. It must stand or fall on its merits, and these can only be ascertained by careful and long-continued observation of a large number of cases. The severe pain and the occasional violent reaction produced by the injections must always be a bar to the universal employment of this method of treatment.

FROG-SKIN GRAFTING.

GEORGE SEELEY SMITH (*Boston Medical and Surgical Journal*, January 24, 1895) was called to see a child who suffered from a severe burn which had destroyed the entire thickness of the skin over a large area of the trunk, face, and neck.

The part involved was traced by a line running from the thyroid cartilage down the median line of the body to within an inch of the umbilicus, and from here following the band of the trousers around to the median line of the back, up to the external occipital protuberance, to the malar bone on the left, including a portion of the ear, diagonally across the face to the right corner of the mouth, and completing the area by connecting this point with the thyroid cartilage.

The case had received but little attention, the fold of the axilla being firmly adherent, through neglect to separate the dressings. As a consequence the arm was firmly bound down and these adhesions had to be broken under ether. An attempt was made to cover this wound by frog-skin grafts. At the first dressing twenty pieces of skin, each a quarter of an inch square and separated from its neighbor by the space of half an inch, were applied. In two days the skin had become identified with the granulating surface, and in five days the grafts had lost their original color, and each had sent forth embryonic epithelium meeting that of its neighbor. In time this epithelium lost its transparency and assumed the character of normal skin. Pieces were taken from the belly and legs of the frog, and also from the back in cases where the frog was small. Grafts from the comparatively thick skin on the back took even more satisfactorily than that from the belly and legs.

The case was dressed and grafted on every second day, and on each occasion from twenty to eighty frog grafts and from ten to twenty human grafts were used. The latter were very small, about one-sixteenth of an inch in diameter, and were placed upon the face and neck until it became evident that the frog-skin would not retain its color.

The method used in dressing was as follows: The surface was first cleansed by irrigating with a warm solution of carbolic acid (1 to 40), and, after the detritus had been entirely cleared away, the parts were washed with a stream of sterilized water. The latter step was to assure asepsis, grafts not thriving under conditions of antisepsis. Each graft was then firmly pressed into the granulating surface. Following this, a dressing of boric acid and vaseline (a drachm to an ounce) was spread upon strips of compress cloth and applied so as to fit the parts snugly. Outside of this was placed sterilized gauze, and as a final step the roller bandage was used.

In all, nearly a thousand frog grafts and about four hundred human grafts were planted. The skin remained soft and immature, requiring constant dressing for three months thereafter.

MULTIPLE GUNSHOT WOUND OF THE ABDOMEN.

BENNETT (*New York Medical Journal*, January 19, 1895) reports the following interesting case:

On August 26 he was summoned to the patient, an Italian laborer, who had been shot

but a short time. The patient complained of great pain in the abdomen, which, on examination revealed a bullet wound about an inch and a half to the right of and a little below the umbilicus; the abdomen was somewhat distended; pulse quick and feeble; respiration, 40; face very pale and anxious. ¼ grain of sulphate of morphine was administered, and the patient sent to his home in a carriage, a short distance away.

He was at once aseptically prepared for operation, anæsthetized with chloroform, and an eight-inch incision made, beginning a little above the umbilicus on the side of the wound and extending through the centre of the linea alba to the pubes; after the peritoneum was opened, between two and three pints of clotted blood poured out.

Beginning at the descending colon, the intestines were carefully examined, and as fast as a wound was found it was sutured with catgut according to Lembert's method.

There were sixteen bullet holes of the intestines found and closed, located in the cæcum, ileum, and jejunum; after washing out the abdomen by using three or four quarts of sterilized warm water, considerable clotted blood and fæcal matter that had oozed through the wounds came away.

The abdominal wound, including the peritoneum, was closed with silk stitching, leaving iodoform gauze at the lower end of the wound, so that it reached down into the pelvic cavity. Iodoform was sprinkled over the edge of the cut surface and the wound dressed with iodoform gauze and absorbent lint, and over all a roller bandage applied.

The operation occupied four hours. The patient rallied quickly from anæsthesia and was put to bed about 11 P.M. He passed a fair night, receiving ¼ grain of sulphate of morphine; temperature, 99.5° F., pulse, 100.

In the evening the temperature rose to 100.5° F., with the pulse about the same as in the morning.

Liquid peptonoids comprised his diet for the ensuing six days, together with a half glass of milk. Each day he improved, and at no time did his pulse rise above 110 or his temperature above 102° F. On the sixth day the gauze drain was removed, together with most of the abdominal sutures, leaving only a few at the lower end of the wound where the drainage had been, the entire wound above the drain having healed.

Four days after operation three or four watery evacuations of the bowels took place, without pain; after this the movements averaged one in thirty-six to forty hours, made in a bedpan, with the patient in a horizontal posture, which posture was maintained for sixteen days.

On the eighth day the diet was varied by milk, eggs, custard, toast, codfish, etc. During the illness there was no distention or tenderness of the abdomen, except around the cut surface.

On the twentieth day after operation pain was complained of in the left sacral region, and a body could be distinctly felt next to the bone. An incision was made the following day, and a thirty-two-calibre conical ball, very much battered, removed. On the 10th of October the patient resumed his former occupation.

TREATMENT OF GONORRHŒAL RHEUMATISM.

LILIENTHAL (*Boston Medical and Surgical Journal*, January 24, 1895) states that at present our knowledge of treatment consists mainly in knowing what not to do. He prefers oil of wintergreen and sodium bicarbonate as drugs, with considerable attention to the use of alkalies. The diseased joint should be splinted at once and gentle pressure over a dressing of twenty-per-cent. ichthyol ointment applied. The urethra or other focus of infection should be carefully treated and the discharge decreased. The bowels should be regulated and a minimum quantity of opium used. If the disease seems to be manageable, gentle massage is valuable during convalescence; but if anchylosis is believed inevitable, it should be assisted by perfect fixation in plaster of Paris. Tonic and stimulant treatment is indicated from the first. If possible, all operative procedures should be avoided. Abscesses must of course be evacuated, but the surgeon should not be deceived by appearances, and thus be led to interfere in an acute stage when there is no abscess to evacuate.

TRACHEOTOMY IN ACCIDENTS OF GENERAL ANÆSTHESIA.

PONCET has twice performed tracheotomy after other means had failed to resuscitate the patients. He states that the only other published case of this kind was reported by Howse in the *British Medical Journal* of 1878, in which, after all the usual methods had failed, tracheotomy was performed and the patient recovered, chloroform being the anæsthetic employed; in Poncet's cases ether was used.

The first case was operated upon one and a quarter hours after pulse and respiration had failed, the interval being consumed by various attempts at resuscitation.

The second was performed immediately after the arrest of respiration; here the indication being plain, as the cyanosis and asphyxia immediately followed obstruction of the larynx by mucus. The canula was removed the following day, and the patient, a girl of fourteen years, recovered.

Poncet claims that when artificial respiration is required, the additional obstruction to the column of air by the larynx, fauces, and nasal passages becomes of unusual importance; when to the natural obstructions are added spasm of the glottis, blood, and mucus, the operation becomes of prime importance. It is necessary, however, to practise artificial respiration after the operation and to carefully clean the tube from time to time. As to the time the interference should be suggested, he would decide that the moment vital phenomena threaten to cease, tracheotomy should be performed.—*Le Mercredi Médicale*, December 26, 1894.

A CONSIDERATION OF SOME OF THE INDICATIONS FOR OPERATION IN HEAD INJURIES.

BULLARD (*Boston Medical and Surgical Journal*, January 24, 1895), in discussing this subject, limits himself to the consideration of some of the indications for immediate operation in cases of head injuries in adults. He states that the symptoms on which reliance should be placed in order to decide upon immediate operation in cases of severe injury may be roughly divided into four groups:

1. The direct local symptoms, those which are immediately due to the injury and are perceptible to the surgeon. Such are wounds, ecchymoses, evident fractures of the cranium, and all other local and evident conditions, due to direct injury in any part of the body, which have any bearing on the diagnosis or prognosis. These are local extracranial or cranial symptoms.

2. The intracranial or indirect local symptoms. In this group are included all localized symptoms which are to be referred to intracranial conditions. Such are the various forms of paralysis, partial or total, of local spasms, and certain conditions of the pupils. Symptoms of this group point more or less distinctly to affections of special portions of the intracranial organs, and so far as they do so are localizing.

3. The third group is a somewhat indefinite one. It includes such general symptoms and conditions as may exist after any injury without special relation to intracranial conditions. Under this heading should be placed the general strength or weakness of the patient and the condition of the pulse. The symptoms of this group Bullard terms the extracranial general symptoms.

4. The intracranial general symptoms. This includes all general conditions presumably due to intracranial conditions. Such are the states of cerebral activity or of cerebral repose: consciousness, semi-consciousness, unconsciousness, coma, and delirium. These may be reasonably referred to intracranial conditions caused by the injury, and may be fairly considered as the index of these conditions.

Passing over the symptoms placed in the first three groups, he states that the primary indication for immediate operation in head injuries is increased intracranial pressure, the question of operation depending upon the degree of this pressure. Whenever it reaches a point sufficient to induce stupor, where the patient cannot be roused by supraorbital pressure, operation is indicated. When the patient can be aroused, the indication is less definite. The lighter cases of unconsciousness which do not tend to become more unconscious should not be operated on at once. In doubtful cases careful watch should be kept for increase in unconsciousness, and as soon as this has been determined operation should be performed. A distinct increase of paralysis of the extremities is also an indication for operation. Gradual increase of paralysis and of unconsciousness in persons under forty suggests middle meningeal hemorrhage. In persons much above this age, where the external injury is slight or doubtful, the question of the presence of slow hemorrhage from some of the deep vessels of the cerebrum must be considered. When, together with unconsciousness, there exists delirium, it is advisable to wait. Localized cerebral irritation, evinced by clonic convulsions, is rarely due to trauma. Where there is no history, convulsions render it probable that the case is non-traumatic.

As to the surgical considerations in the operation, the author lays down the following rules:

Be sure that the opening in the cranium is sufficiently large. In the ordinary case nothing smaller than a one-inch trephine should be used, and then the opening enlarged, with bone forceps, if possible. An opening, as a rule, to be efficient should be at least two inches by

one. The opening should be made as quickly as possible, with as little jar as may be to the patient and without laceration of the dura.

The dura should always be opened where there is evidence of intradural pressure. There is no more danger in opening the dura under proper antiseptic or aseptic precautions than there is in opening any other serous cavity.

Remember that in these operations time is an important factor. Do what has to be done as rapidly as possible. In children, many deaths are caused in these operations by loss of time. In adults, the consequences are not, as a rule, so serious; nevertheless, next to asepsis, time is probably the most important factor in the success of an exploratory cranial operation.

In an exploratory operation where it is not certain that a large extradural clot exists, look out for the middle meningeal artery. Remember that it runs in a deep groove on the inner surface of the cranium, and that in trephining directly over it, unless the dura be separated in some way from the cranium, the artery is likely to be cut by the trephine before the bone has been completely sawed through. Again, remember how closely the dura is or may be attached to the inner surface of the cranium, and that, in cutting with bone forceps in the course of the artery or its branches, great care must be taken not to tear or cut the blood-vessel.

All cases of intracranial hemorrhage with which the surgeon has to deal can be stopped, of course, by pressure. Ligating the vessel when possible is preferable, but sometimes it is not possible.

In regard to the point about to be mentioned the author is somewhat in doubt, and simply calls the reader's attention to it. This is the length of time during which packing should be left in the intracranial cavity. He is inclined to think that the present tendency is to remove it too early.

THE VALUE OF ALUMNOL IN THE TREATMENT OF GONORRHŒA IN WOMEN.

At the session of the Société de Médecine de Gand, October 2, 1894, Dr. Gommaerts submitted the results of his experience with alumnol in the service of the civil hospital of Gand.

He employs alumnol in solutions of one to five per cent. in vaginitis or endometritis of gonorrhœal origin, by injections, using the intrauterine catheter of Bosman. The injections were made every three days, and after three or four injections the secretions had markedly decreased.

The following precautions are to be observed in the treatment:

1. The solution should be fresh.
2. Dilate primarily the cervix uteri.
3. Irrigate under a feeble pressure, to avoid forcing the contents of the uterus into the tubes or peritoneal cavity.—*La Presse Médicale*, October 14, 1894, Belge.

FOR THE RELIEF OF PAINFUL SWALLOWING IN PHTHISICAL PATIENTS.

Lermoyez (*Journal des Praticiens*, May, 1894) recommends insufflations of the following powder instead of painting with cocaine:

℞ Morphii hydrochlor.,
Sacchari lact., of each, gr. xx;
Gummi arab., gr. xv. M.
Fiant pulv. no. lx.

Of this powder only about ½ grain should be used at each insufflation.

The application should be made before meals especially, and the effect lasts for many hours.—*Therap. Monatschr.*, October, 1894.

EXCISION OF THE INITIAL LESION.

King (*Canadian Practitioner*, December 15, 1894; quoted from *Medical News*) holds that if it is possible to see a chancre during the first few hours of its existence and to at once excise it, the disease may be aborted. He records a case in point: A man developed a sore fifteen days after connection with a woman who had a skin-disease on her body. This woman, on examination, was found to be suffering from mucous patches of the vulva. The sore on the man was immediately excised, the wound was closed with silk sutures, and healed by first intention. No hardness developed in the cicatrix and no symptoms had presented themselves ten months later. In six other cases, the sore having existed from four to fourteen days, the excision very materially modified the subsequent course of the disease. The rash appeared very mildly in all from forty to forty-five days from the appearance of the chancre. Four entirely escaped any other symptoms. Two showed very slight and easily controlled mucous patches on the tonsils, but suffered from no further manifestations of the disease.

King draws from his study the following conclusions:

That the early excision of the chancres—that is, within a few hours after their appearance—will abort the disease.

That the excision of any unhealed chancre will moderate the subsequent secondary manifestations.

That excision constitutes the cleanest, least painful, and most scientific method of treating the lesion.

TREATMENT OF STAB AND GUNSHOT WOUNDS.

The report of the cases given below will doubtless prove of interest to the readers of the GAZETTE, from the fact that every practitioner, both in the city and in the rural districts, is confronted from time to time with emergency cases in which prompt action and heroic measures mean everything to the life of the patient and to the reputation of the physician.

The first case occurred in a male adult, who became involved in a saloon brawl and received two gunshot wounds,—one of the head and one of the abdomen. After a temporary dressing he was sent to a hospital, arriving there two hours after infliction of wounds.

SCOTT (*Kansas City Medical Index*, December, 1894) found on examination a wound of entrance on patient's forehead, just above the supraorbital notch, a bullet from a thirty-eight calibre revolver having penetrated the frontal plate, ranging outward, downward, and backward between the frontal and orbital plates, destroying the right optic nerve and vision of right eye. In the abdominal wound, the bullet entered at a point on a line midway between the left nipple and umbilicus, passing through the abdominal wall, barely missing the great curvature of the stomach, penetrating the right and left lobes of the liver, and embedding itself in the intercostal muscles of the right side, where it was readily located, just beneath the integument. It was decided best not to operate till next morning. Accordingly, fourteen hours after the accident, the patient having recovered from shock and loss of blood, was placed on the operating-table and anæsthetized. After the usual antiseptic precautions had been taken, the scalp was divided by an incision three inches long over wound of entrance, the periosteum gently pushed aside, and the trephine applied. A button of bone was removed from the frontal eminence and the bullet located by probing; it was found embedded in the greater wing of the sphenoid and removed without great difficulty. In its passage the bullet had shattered the orbital plate of the frontal bone, fragments of which had destroyed the optic nerve; portions of depressed bone were raised by the elevator, and the opening enlarged by rongeur forceps. The wound was closed by interrupted sutures and dressed with iodoform powder and iodoform and bichloride gauze.

Careful inspection of the abdominal wound showed that the bullet had ranged transversely across the body from a point on a line midway between the left nipple and umbilicus to a point one inch posterior to a line on the right side drawn vertically from the crest of the ilium to a point between the ninth and tenth ribs. Both wounds were left open and packed with iodoform gauze, antiseptically dressed, and patient put to bed. At 6 P.M. patient had recovered well from anæsthesia and shock, and was resting quietly; his temperature was but 99.5° F., pulse 80, respiration 40; he was given castor oil, ½ ounce, with turpentine emulsion, 1 drachm, and passed a comfortable night. Two days after injury patient's bowels moved. At 6 P.M. he was given saline solution, ½ ounce, with turpentine emulsion, 1 drachm; his temperature was normal, respiration 36, pulse 80. On this day some symptoms of general peritonitis were manifest, and he was put on small and frequent doses of saline solution, and this was continued for several days.

From August 23 to September 1 he was given liquid peptonoids, with creosote *t. i. d.* His temperature varied from normal to 100.5° F., which point was reached at 6 P.M. the third day. The improvement rapidly continued until, fifteen days from operation, he left the hospital. He soon regained his former strength and activity and resumed his former vocation as hotel porter.

The second case is that of a fireman, aged twenty-five years, possessing a remarkably robust physique. One hour previous to entrance he received six desperate stab wounds,—three in chest and three in abdomen. He was very weak from shock and loss of blood. Immediately on arrival he was placed upon operating-table, temporary dressing removed, and thorough examination made.

The first wound examined was a stab of the abdomen in the left epigastric region which penetrated the abdominal cavity, causing a portion of the omentum as large as the hand to protrude. The wound was over an inch in length. A second wound of the abdomen was located just over the greater curvature of the stomach and extending down upon that organ. The third abdominal wound was somewhat smaller

and located a few inches above the crest of the ilium on the left side. One of the chest wounds was located about five inches below the axilla and penetrated lung-tissue on the left side. Another stab wound was midway between the axilla and left nipple; this penetrated the pectoral major and minor muscles, entering lung-tissue. The third chest wound was located midway between the left nipple and centre of sternum; this wound was small but dangerous, penetrating the chest cavity over the heart and entering the pericardium. The patient was anæsthetized and antiseptically prepared for operation. The first wound penetrating the abdominal cavity was enlarged, the intestines were found uninjured, the large piece of omentum protruding was ligated and cut off, the wound was partially closed, and drainage established with iodoform gauze. The wound over the stomach was cleansed and packed with iodoform gauze, likewise the other wounds. The patient was put in bed, and rallied fairly from anæsthesia and shock. During the next week temperature ranged from 99.8° to 101.8° F. on the seventh day, when, circumscribed peritonitis manifesting itself, the largest abdominal wound was opened and two ounces of pus removed. From this time forward the temperature ranged between 98° and 99° F., and patient improved steadily and rapidly. The wounds were dressed every day, then every other day. So rapid was his recovery that in two weeks he was up and able to go home.

Reviews.

Relations of Diseases of the Eye to General Diseases. By Max Knies, Professor Extraordinary at the University of Freiburg. Edited by Henry D. Noyes, A.M., M.D.

Within the last ten or fifteen years the importance of the study of the eye in general diseases has been more and more recognized, as ophthalmologists and medical clinicians have, side by side, made discovery after discovery proving the importance of ophthalmological examinations in making a general medical diagnosis. This volume, written by one of the best European ophthalmologists, and, fortunately, edited by an American ophthalmologist whose reputation is even wider than that of the author of the book, presents to us in complete and attractive form practically all the reliable information which should be considered in a volume having this title. Under the head of Poisons and Infectious Diseases we note with interest the great care which the author and the editor have bestowed upon the effects which various drugs produce on the eye, which is by far the most complete summary of this subject which we have seen, save the monograph upon Toxic Amblyopia by De Schweinitz, which received the Alvarenga Prize from the College of Physicians in 1894.

Another interesting and valuable addition to the book is the fact that the American editor, recognizing the work of his countrymen, has placed in brackets references to American papers which he considers worthy of note.

Another portion of the book which seems to us of peculiar value is the chapters upon the Relation of the Eye to Diseases of the Nervous System, a portion of medical science which within the last few years has progressed with extraordinary strides, owing to the studies made by those who are interested in cerebral localization.

The thanks of the profession are not only due to Professor Knies for writing this book, but still more in this country to the eminent editor of the American edition for his presentation of its information in our language.

H. A. H.

Sexual Neurasthenia: Its Hygiene, Causes, Symptoms, and Treatment, with a Chapter on Diet for the Nervous. By George M. Beard, A.M., M.D. Edited, with notes and additions, by A. D. Rockwell, A.M., M.D. Fourth edition, with formulas.
New York: E. B. Treat & Co., 1895.

The authors give an introduction embracing the philosophy of the work. This strikes the reader as somewhat vague, though perhaps not more so than the complicated affection of which they write. The statement that true spermatorrhœa is a symptom of frequent occurrence in all kinds of neurasthenia, as well as in many other debilitating diseases, requires further proof than is adduced in the body of the book.

Neurasthenia is stated to be the result largely of reflex irritations arising from various parts of the body. The evolution and relation of the sexual sense, the relation of neurasthenia to other diseases, and sexual hygiene are briefly considered. Some seventy-odd pages of the book are taken up with illustrative cases and about fifty pages are devoted to treatment. In this relation it is interesting to note that the authors advise frequent change of treatment, holding that the common idea as to the wearing out of one mode of medication is correct, and stating that the patients often need a new kind of treatment as they need a new suit of clothes. Work is advised as of first importance, and

giving up an occupation for travel is condemned as one of the worst of all prescriptions. Massage is considered as a minor means of treatment and as an adjuvant to more powerful procedures like Turkish and Russian baths.

It is interesting to learn, in relation to marriage as a therapeutic measure for sexual neurasthenics, that the patients may be divided into two classes: first, those who are positively benefited; second, those who are positively injured. No means are given for determining to which class any individual should be relegated.

As local sedatives are recommended hydrastis, epigæa repens, triticum repens, stigmata of maize, rhus aromaticus, eucalyptus, digitalis and digitalin, alkalies, cantharides in very minute doses, belladonna, atropine, ergot and ergotine, lupuline, camphor, bromide of camphor, gelsemium, cimicifuga. As general sedatives, physostigma, the bromides of sodium, ammonium, lithium, potassium, calcium, and hydrobromic acid, glonoin, scutellaria, cypripedin, cannabis indica, lactucarium, hyoscyamus and hyoscyamin, conium, convallaria.

Most physicians will agree with the author that patients who are kept awake, instead of being put to sleep, by bromides, should not take them. As general tonics, among others more commonly employed, are mentioned quassia, calumbo, phosphorus in all its forms, the salts of zinc and silver.

Electricity, in so far as space is concerned, occupies the first position in therapeutics. A few paragraphs are devoted to baths, douches, and rectal treatment, cauterization, and soothing injections and counter-irritation. Under surgical treatment circumcision alone is mentioned.

A chapter is devoted to the diet of the nervous, another to sexual erethism, and the book is closed by sixteen prescriptions.

This book is interesting reading, and is evidently the product of a philosophical brain.

TRAVAUX SUR ÉLECTROTHÉRAPIE GYNÉCOLOGIQUE. Fondées et publiées par le Dr. G. Apostoli.
Paris: Société d'Éditions Scientifique, 4 Rue Antoine-Dubois, 1894.

This volume, the first of a series to be published every six months, under the editorship of Dr. G. Apostoli, the well-known champion of electrotherapeutics, is in the nature of a compilation of the works of Continental and American writers on this special subject.

Among the English names we notice those of Thomas Keith, Skene Keith, Sir Spencer Wells, and Playfair. From America those of Rockwell, Goelet, P. F. Mundé, Massey, and others; then follow those of Russian, Italian, Belgium, and German writers.

This, the first volume, comprises some seven hundred pages, of which more than three hundred and fifty are devoted to the report of cases, making, in all, very dry and unprofitable reading to any but the most enthusiastic advocate of this one branch of therapeutics.

The electrical treatment of fibroids, as advised by Apostoli, requires such a complicated armamentarium, minute technique, and the sacrifice of so much time on the part of the operator that it necessarily passes beyond the hands of most gynæcologists.

On the other hand, its most enthusiastic advocates cannot claim for it more than a palliative *rôle*, the percentage of cures being so small—one and a half to two per cent.—that this could be easily explained by errors in diagnosis. It is true that the method is not dangerous to life in the majority of cases, but yet there remains a certain proportion in which death has followed its use in the hands of most skilful operators, showing that its indiscriminate application is not free from all danger. Every experienced gynæcologist knows how impossible it is to exclude the presence of small foci of inflammation in old and extensive fibroids of the uterus, and, if present, how quickly they can be rekindled by the passage of even mild electrical currents. If an acute general peritonitis be not at once set up by the application of such high currents as he advises, sufficient inflammatory adhesions are developed to increase tenfold the difficulties of hysterectomy, the operation which eventually most of these patients must undergo for their permanent cure.

The mortality in the radical cure of fibroids, in the hands of good operators, is so small that the electrical treatment, with its complicated technique and small percentage of cures, will never come into general use, but will be limited to the hands of a few specialists,—men who, from that lack of scepticism so necessary to the able physician, are led to look upon it as the panacea for all the ills to which flesh is heir.

Although the editor of this book is a Frenchman, we believe, and the book published in Paris, this first volume is composed entirely of articles written by foreign writers, the author claiming that "because it is unfortunately a custom in France that all new doctrines or teachings which do not emanate directly from an official source do not receive definite sanction until they have been returned to us from abroad." But this assertion should rather be

taken as an indirect admission that gynæcological electrotherapeutics, as taught by the author, has not found much favor in France.

D. T. L.

DISEASES OF THE EAR. A TEXT-BOOK FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By Edward Bradford Dench, Ph.B., M.D. Illustrated. Colored plates.

New York: D. Appleton & Co., 1894.

As professor of diseases of the ear in the Bellevue Hospital Medical College, Dr. Dench has ample opportunities of studying otology, both as a teacher and as a clinician, and the book which he has presented to the medical profession, containing, as it does, nearly seven hundred pages of closely-printed matter, embodies the result of his wide experience. He has been fortunate, too, in that he has written a work readily scanned and still more readily followed by the practitioner who is unfortunate enough to be unable to call to his aid a skilled specialist in every ear case which causes him uneasiness.

The illustrations are all of them unusually good. Many of them are original, and some of the colored plates are exceedingly interesting and clear. Plate I. is interesting to the physician who is not familiar with the anatomy of the ear, showing, as it does, the blood-supply of the conducting apparatus, while the pathological conditions, which are discussed on almost every page, are many of them equally clearly illustrated. The operation for abscess of the mastoid is illustrated by a colored plate, as is also that for the exploration of the tympanic roof, lateral sinus, and cerebellum.

The book contains much information of great value to the general surgeon as well as to the otologist, and we congratulate both the author and publishers upon the presentation of such a valuable work to the profession.

BRAITHWAITE'S RETROSPECT OF MEDICINE. Vol. cx. July to December, 1894.

In the THERAPEUTIC GAZETTE for November 15, 1893, we stated that Braithwaite's "Retrospect" still held the field as one of the best brief summaries of medical progress during the year 1892, and this statement can be repeated with emphasis in regard to its more recent issues. As most of our readers know, the first half of the volume is taken up with brief discourses concerning medicine and therapeutics and some of the specialties, while the latter part, which considers general surgery and therapeutics, consists of much longer articles, not so carefully prepared for the hurried reader. We think that this constantly-repeated error in editorial work is the only thing which can stand against the universal success of this valuable publication, which forms, perhaps, the best consecutive summary of medical advance during the last fifty years.

A MANUAL OF ORGANIC MATERIA MEDICA AND PHARMACOGNOSY. AN INTRODUCTION TO THE STUDY OF THE VEGETABLE KINGDOM AND THE VEGETABLE AND ANIMAL PRODUCTS. By Lucius E. Sayre. Copiously illustrated.

Philadelphia: P. Blakiston, Son & Co., 1895.

This book is not only a credit to its author, but to the profession of pharmacy. It contains very little information that is of direct practical use to the ordinary practising physician, because it does not attempt to deal with the therapeutic applications of the various substances which it discusses, but it will afford teachers of medical botany and their students a clear insight into what, to some persons, is a difficult study. The many original and accurate drawings will aid in impressing upon the mind's eye those facts which his intellectual centres must retain. To those physicians who are sufficiently interested in materia medica and botany to find recreation in studying crude drugs and their derivatives we can earnestly commend this book.

THE PHYSIOLOGY OF THE CARBOHYDRATES: THEIR APPLICATION AS FOOD AND THEIR RELATION TO DIABETES. By F. W. Pavy, LL.D., F.R.S.

London: J. & A. Churchill, 1894.

The name of Dr. Pavy must a long time remain intimately associated with the important subject of diabetes and its dietetics. For many years he has devoted a large part of his time not only to clinical studies in connection with this malady, but has been active in laboratory investigation as well. The present book chiefly deals with the experimental side of the question, and the author sets forth views which are almost in direct antagonism with those which are universally accepted by physicians the world over, holding that the carbohydrates are not as injurious in cases of diabetes as we are wont to think they are. He believes that the glycogenic doctrine in diabetes is to be abandoned, on the ground that it rests upon a false foundation; for he states that the liver, instead of forming sugar, prevents its entering into the general circulation, and thus secures safety from diabetes. In other words, diabetes is a failure or impairment of the power of disposing of carbohydrates before the general circulation is reached. He believes that when carbohydrates are taken into the body they undergo transmutation, and are applied to the formation of proteid materials and of fat. It

is only right to state that the views which Dr. Pavy has advanced, while they are deserving of the most careful analysis and consideration by physiologists and physicians, are open to many criticisms, and have already been severely criticised in a friendly manner by several writers. Perhaps the most notable article attacking his views is that which appeared in the *Edinburgh Medical Journal* for December, 1894. To those who are especially interested in the subject of diabetes we earnestly commend the careful perusal and scientific study of Dr. Pavy's experiments, conclusions, and hypotheses.

NOTES ON THE NEWER REMEDIES: THEIR THERAPEUTIC APPLICATION AND MODES OF ADMINISTRATION. By David Cerna, Ph.D., M.D. Second edition, revised and enlarged.
Philadelphia: W. B. Saunders, 1895.

It gave us much pleasure in 1892 to favorably review this summary of our knowledge of extra-pharmacopœial remedies which Dr. Cerna had ably written. The work of recording concisely and accurately the very various and often discrepant reports concerning the action of new medicaments has been well carried out, and the second edition has been benefited by the elimination of those almost unavoidable errors which the first edition contained. The book does not profess to be a text-book of therapeutics, but its object is to give the physician competent information concerning new vegetable and synthetic products in the manner which its title indicates. For this reason it is a useful adjunct to the standard works on materia medica and therapeutics. We cordially commend it to those physicians who, from time to time, are at a loss concerning the dosage and the physiological and therapeutic activities of unfamiliar remedies.

MATERIA MEDICA AND THERAPEUTICS FOR PHYSICIANS AND STUDENTS. By John B. Biddle, M.D. Thirteenth edition, revised, rearranged, and enlarged by Clement Biddle, M.D. Illustrated.
Philadelphia: P. Blakiston, Son & Co., 1895.

When a book upon any medical topic reaches its thirteenth edition, many years after the death of its distinguished author, it shows that the volume depends upon the work of the writer and the editor, and that its popularity in this instance was not solely dependent upon the individuality of Dr. Biddle while living. The difficult task of keeping the thirteenth edition in touch with modern therapeutic progress has been essayed by Dr. Biddle, the son, with unusual success, and to those who believe in teaching a considerable amount of medical botany in lectures upon therapeutics this volume will still continue to be popular as a text-book.

It is hardly necessary to add that care has been taken to render this issue in accord with the Pharmacopœia of 1890, and it is only in a few places that we notice that the text has not been brought up, from the therapeutic and physiological stand-point, abreast of the most recent literature.

The indices are copious, and a large appendix gives the page upon which each drug is considered, its dose in apothecaries' measure and the metric system, and the maximum quantity of the drug which may be administered in twenty-four hours. Those who are familiar with the book will remember that its arrangement is by classification and not alphabetical.

Correspondence.

LONDON.

(From our Special Correspondent.)

The medical world here is very active at the present time. Each journal contains many notices of meetings of societies, general and special, while numerous lectures are being given free to medical practitioners and advanced students by prominent men in the different specialties. Among others, a series of four lectures has been recently given by Dr. Lennox Browne on diphtheria, many points in which, I think, would prove of interest to your readers. Under treatment other than antitoxin, he gave the following statistics of one thousand cases:

	No. of Cases.	Deaths.	Percentage of Deaths.
Under 5 years.....	402	181	45.0
5 to 10 years.....	316	83	26.2
10 to 15 years.....	104	12	11.7
Over 15 years.....	178	7	3.88

In cases where the nasal cavity was involved a death-rate of sixty-seven per cent. was recorded, and in laryngeal cases that of fifty per cent. He considered pain in the back in severe cases a pathognomonic sign, as much so as in small-pox; also that the temperature does not rise from extension of membrane, but as a result of adenitis, when it may rise very high,—to 104° or 105° F.

In his last lecture, delivered January 28, he took up more particularly the treatment by antitoxin and the results obtained by it. "The new remedy," he believed, "was going to be successful." As to dosage, the age or weight was not the factor in judging the amount of the remedy to be used, but rather the gravity of

the attack. He wished to warn his hearers of the risks that he thought attended the administration of antitoxin. It was hardly reasonable to suppose that a remedy capable of effecting such a marvellous change in patients of tender years, whose system was saturated with deadly poison, was incapable in any case of overshooting its mark. Refusal to recognize such a possibility was to create a fool's paradise.

He placed the risks in order of seriousness as cardiac failure, accentuated tendency to nephritis, septicæmia. In six cases of death in succession post-mortem revealed the cause of death to be due to anæmia. The therapeutic action, in his opinion, was due to (1) an embolism of the capillaries and (2) to the casting off of the membrane.

Two conditions were necessary to found a judgment as to the value of the remedy: first, that a bacteriological examination of membrane in each case should be made; and, second, that a post-mortem examination should be made in all fatal cases.

The following comparative mortuary statistics were given:

Place.	Percentage of Deaths under Old Treatment.	Percentage under Antitoxin.
Berlin (Körte).....	53.8	33.1
Berlin (Aronson).....	32.5 to 41.7	12.1
Buda-Pesth	53.8	33.1
Paris.....	51.7	24.5
New York.....	42.7	25.0

In these the results of the use of antitoxin were not much better than in the fever hospitals of London under the old treatment, as shown below:

In five asylum board hospitals in 1892 there were 2009 cases, with 583 deaths; in 1893, 2848 cases, with 865 deaths, giving a percentage of 29.8; and in the Northwestern Fever Hospital, 1249 cases, with 332 deaths, giving a percentage of 26.4. The results of the use of antitoxin in the latter hospital: of cases admitted since January 1, 1895, numbering 45, in which the clinical diagnosis was confirmed by the microscope, only 2 deaths had occurred. At this hospital every case admitted since the new year received an injection of the remedy as soon as admitted, and again, if requiring it, on the following day, the old line of treatment being followed out at the same time. The old and well-tried methods of treatment should be followed in every case, and the antitoxin should be only used as an addition. He advocated the forcible removal of the membrane where possible, and also of removal of tonsils and of adenoid tissue if obstructing breathing. That the public were appreciating the advantages of the new treatment was evidenced by the earlier period in which patients now presented themselves for treatment. Although expressing his belief that antitoxin would be found to strengthen very much the hands of the physician in fighting this dread disease, no definite conclusion could be come to, as yet, as to its full value.

A paper by Dr. Jessop, read before the Ophthalmological Society of Great Britain, on two cases of diphtheritic conjunctivitis, was another tribute to the value of antitoxin. In each case was there a well-defined membrane formed, which was diagnosed as diphtheritic, and that diagnosis confirmed by the bacteriologist of St. Bartholomew's. The first case was given three injections of 1½ drachms of Klein's antitoxin on the first, second, and fourth day. The case was characterized by subnormal temperature during the whole course of the disease. In the second case membrane was present in each eye. In this case only two injections of 1 drachm each of the same preparation were used on the first and second day. In each case no other treatment was used in the eyes, except washing them out with pure water. In both cases a complete recovery was made and without any damage being done to the eyes.

The profession here and in the provinces are waging a strong war on the system of club practice, which is such a curse to the medical profession at home, and with apparent likelihood of a successful issue to their efforts.

The Medical Council is taking action to restrict the practice of midwives in Great Britain, by whom the greater part of the obstetrical practice is done. Considerable correspondence, *pro* and *con*, is being carried on at the present time in the medical journals, letters appearing from the pens of Dr. Playfair, Sir John Williams, and others.

That mistakes in diagnosis are not alone confined to the second rank in the medical and surgical profession is well illustrated by a case of a celebrated surgeon of London, who, on January 18, when an abdominal section was made for removal of an ovarian cyst, found instead a normal pregnancy which had to be dealt with.

The European relation of our good American friend the oyster has come in for severe condemnation at the hands of prominent medical men of London as being the cause of typhoid fever. The allegation does not as yet appear to be proved, and no great falling off in the public demand appears to have taken place, if a person may judge by the continued high price of the bivalve.

CHLOROFORM IN PARTURITION; FOSTER ON GONORRHŒA.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—In your heading on "The Safety of Chloroform in Parturition," I think you forgot an important factor in accounting for the much greater safety of chloroform in obstetrical than surgical practice. When a person is about to undergo a surgical operation the whole nervous system is depressed, all the centres, and the whole mind is full of apprehension of danger. In many the psychic condition is such as to bring the dynamic nerve force almost to a stand-still; in fact, this every now and then takes place. Such cases, in this condition, fall an easy prey to the first influences of chloroform. In the obstetric patient this is all changed. The patient has the hope and inspiration of soon becoming a mother. She is suffering pain and knows chloroform will relieve it, and she breathes it with confidence, with a firm belief that while it relieves her agonies, it does not interfere in the least with her hope of soon becoming a mother.

I notice with considerable astonishment Dr. Burnside Foster's "Ideal Treatment of Gonorrhœa." The idea is a first-class one, and if Dr. Foster will have the experiment tried on himself and patent the idea his name will no doubt be handed down to an appreciative posterity. I believe, though, a better prescription could be given for "elevating the standard of sexual morality," for methinks "a man would hesitate much more before running the risk of acquiring a disease which demands for its cure such radical means" as amputation of the penis or removing both testicles. The treatment I suggest would be much more deterring, and therefore would raise the standard of morality a great deal higher.

Yours obediently,

F. GUNDRUM, M.D.

ESCONDIDO, CAL.

[The importance of considering fear as a factor in producing evil results in chloroform anæsthesia was considered editorially in the GAZETTE of January 15, 1892.—ED.]

SALICYLATE OF BISMUTH AS A DRESSING.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—Of the many powders which have been proposed as a substitute for iodoform in its external applications, the only one which, in my opinion, deserves in many cases to take its place is salicylate of bismuth. I have experimented on its action for about two years in different kinds of ulcerations of the skin, and I have come to the following conclusions:

1. In the first period of the chancroid and in tubercular ulcerations of the skin, if the salicylate of bismuth is dusted once a day on the diseased area, after a few applications the granulations become florid and the lesion shows a marked tendency towards cicatrization. As soon as the granulations appear healthy, the salicylate of bismuth is better applied mixed with subnitrate or subgallate of bismuth (1 to 2), which mixture is generally sufficient to cause the complete cicatrization of the ulcer. Of course the application of the powder must be preceded by a thorough cleansing of the lesion with an antiseptic solution.

2. The salicylate of bismuth is in the abovementioned cases preferable to iodoform, because, while it gives the same and sometimes better results, it is exempt from the unpleasant odor of the other, and never causes that troublesome eczema which many times is a serious obstacle to the use of iodoform.

R. BRINDISI, M.D.

BOSTON, MASS., February 7, 1895.

COCAINE-POISONING.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—Dr. Teeter's case of poisoning by cocaine, as reported in your last number, is instructive, as it illustrates how cocaine-poisoning occurs. It is exactly similar to other cases reported every week with sickening regularity. In short, the fatal dose of cocaine is from ½ to 2 grains. The doctor gave 1¾ grains, and had the good luck to have the patient live through it. A few weeks ago the *New York Medical Journal* reported a fatal case exactly like it. From 8 to 10 minims of a two-per-cent. solution, with a ligature tied above, would have given a painless operation. It is criminal malpractice to use the drug recklessly, and the result should be a warning. The maximum dose for local anæsthesia hypodermically should be ¼ grain. With that dose a finger or toe may be amputated or a nail evulsed or extirpated painlessly.

W. H. PETERS, B.S., A.C., M.D., etc.

LAFAYETTE, IND., January 25, 1895.

THE EFFECTS OF UNILATERAL CASTRATION ON THE PROSTATE.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—I should like to ask through your columns for information from surgeons in this country as to the effect of unilateral castration upon the total bulk of the prostate.

The existing evidence is scanty, but seems to point entirely to one-sided atrophy of the prostate as a common result of the removal of one testicle. Some experiments which I am now making on dogs corroborate this view, as does the observed condition of the prostate in monorchids. If it is found that the diminution in size extends to the other lobe, or if the shrinking of one lobe will in any large proportion of cases remove or lessen the mechanical obstruction to urination, it is obvious that the good effects of a simple and safe operation might at once be extended to a much larger number of patients and at an earlier and more favorable stage of the disease.

I now have several cases under observation, and hope by further experiment to throw more light on the subject; but conclusive clinical evidence must already be in existence, and I write in the hope that it will be sought for by those surgeons who have removed one testicle for disease or injury and whose patients are accessible for examination.

I am, sir,
Yours, etc.,
J. WILLIAM WHITE.

1810 SOUTH RITTENHOUSE SQUARE,
PHILADELPHIA, PA., February 5, 1895.

SOLANUM CAROLINENSIS IN EPILEPSY.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—A year or more ago I suggested writing you a note on the use of solanum carolinensis, and you very courteously informed me that it would be quite acceptable. One thing after another interfered to prevent my doing so at once, and it has been neglected until I was reminded of it by your editorial note in the THERAPEUTIC GAZETTE for February, 1895. The case which I wish especially to relate is that of a young man, twenty years of age, of good parentage on the father's side, but on the mother's side there was some tuberculosis. The boy himself is very large and strong, always lived on a farm, and was given to no vices. He had epilepsy several months before coming to me, and at that time (in May, 1893) he was having the attacks at intervals of about three weeks, usually in the early morning, at three or four o'clock, but sometimes in daytime, at the table, or while at his work in the fields. From the description, they were genuine epileptic seizures, and he was given Brown-Séquard's prescription, with the result of lengthening somewhat the intervals and modifying the severity of the convulsions. About the 1st of September, 1893, he began taking the horse-nettle fluid extract in 10-drop doses. In about three weeks he had a hard convulsion. The dose was increased to 15 drops, then to 20, 25, and finally 30 drops three times a day. There has been no convulsion since September 23, 1893. The boy has taken the medicine regularly, until during the last six months he was permitted to take it twice a day, and to take two vacations of two weeks each. It may not have been the solanum carolinensis that interrupted the attacks, but if it was not, the coincidence is a strange one. I am inclined to the belief that fairly large doses are more likely to be of use, and have had no complaint of any disagreeable effects. I have used it in several cases, but not in any where I felt as positive of the correctness of my diagnosis, and at the same time had so obedient and faithful a patient.

If this imperfect note can be made use of, you are at liberty to do with it what you think best, and may or may not use my name in connection with it. I would quite as lief be mentioned simply as a correspondent. My object is to call more general attention, or rather assist feebly in calling attention, to a drug—I do not like to say a *remedy*—that seems to promise some help in this class of cases. I will regard it as a favor if you will acknowledge the receipt of this, and whether I can make it any more satisfactory by adding words, or, if you please, writing more at length.

Very respectfully yours,
E. C. CARR.

COSHOCTON, OHIO.

Notes and Queries.

FRAUDULENT SUBSCRIPTION AGENTS.

We understand that a man representing himself as an agent of the Consolidated Book Company, of 133 Vandewater Street, New York, has collected subscriptions to the THERAPEUTIC GAZETTE from physicians in Tennessee, claiming that his concern has a special agreement with the publisher of the GAZETTE by means of which it is able to offer this journal at reduced rates. As this is not the case and as there is no such concern at 133 Vandewater Street, New York, we warn physicians against this imposition.

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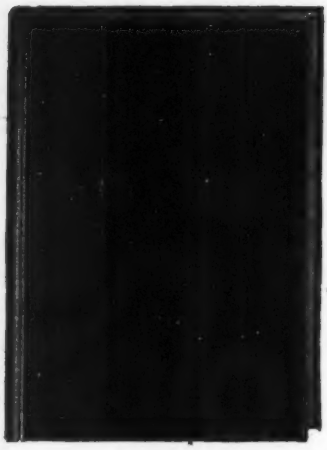

PRINCIPLES AND PRACTICE
OF
BANDAGING.

BY

GWILYM G. DAVIS, M.D.,

UNIVERSITIES OF PENNSYLVANIA AND GOTTINGEN,

Member of the Royal College of Surgeons, England; Assistant Demonstrator of Surgery, University of Pennsylvania; Surgeon to the Out-Patient Departments of the Episcopal and Children's Hospitals; Assistant Surgeon to the Orthopedic Hospital.

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